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# SOAP and SANITARY CHEMICALS

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| | |
|---|---|
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| Molecular Weight | 100.51 |
| Color | Colorless |
| Melting Point | —130.8° C |
| Boiling Point | —9.2° C |
| Density | 1.194 at —10° C |
| Latent heat of vaporization | 96 B.t.u./lb. |

**Vapor pressure (p.s.i. abs.):**

| | |
|---|---|
| —30° C | 6.0 |
| —10° C | 14.7 |
| 10° C | 31.2 |
| 30° C | 59.0 |

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# AS THE EDITOR SEES IT

SLACK filled soap packages are in the spotlight again. With most state legislatures in session at present, the old bugaboo of weights and measures bills, including also slack-filled package regulations, has arisen to confront packagers of soap chips, flakes, powders, granules, and the like. Each odd year, this has become a problem for the soap industry, and 1947 is no exception. Because of the inherent characteristics of most finely-divided soap products,—high moisture content and frangibility particularly,—package weight loss and volume shrinkage have for years dogged the industry's footsteps. Zealous state legislators and other officials, unaware that these conditions are mostly beyond the immediate control of soap manufacturers, once more plan to correct them.

As in the past, the soap industry again can present its case to the states as bills or regulations arise and hope that the states will understand. At the same time, each and every soaper can help to minimize such activity every two years by rechecking his own formulations, his packages and his packaging operations. Some products which we have seen invite regulatory attention because of apparent careless or deliberate slack filling. Hence, a correction of packaging shortcomings, if any, makes a good start toward removing the causes behind this type of legislation and regulation.

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BASED on the economic history of the world for the past half-century, we suspect that Uncle Sam should long since have been renamed Santa Claus. Operations under UNRRA and more recently under the International Emergency Food Council are the most recent happenings which indicate that Europe, Asia, and other sections of the world will take all of everything which we will give them and not hesitate to ask for more. To aid starving and helpless peoples is praiseworthy and noble. But where American participation in such aid is used to reduce the efforts of certain foreign governments and others to help themselves, the time to put the searchlight on the situation has arrived.

And, apparently, this is just about what is happening in oils and fats. Uncle Sam, alias Santa Claus, is the heaviest loser and right now is paying through the nose as a result of IEFC world fat allocations. We deeply suspect that American fat consumers are once more being played for suckers. Recently, before the House Food Investigating Committee in Washington, John B. Gordon of the Bureau of Raw Materials for the American Vegetable Fats and Oils Industries urged that the U. S. withdraw from the IEFC world fat allocation program. We want to second this suggestion,—and also urge that with the expiration of present commitments on March 31, that the U. S. terminate its participation at least until we find out exactly how things stand.

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EDUCATION is the real answer to proper and sanitary washing of dishes and utensils in public eating and drinking establishments. Teach the restaurant, tavern, soda fountain and other owner and his personnel the rudiments of sanitation and correct dishwashing, follow it up with strong law enforcement, and the result is an improved sanitary condition throughout all public eating places. These are conclusions of Charles McDonald, director of the Dairy and Food Division of the Akron, Ohio, Health Department, which department conducts a continuing educational campaign among restaurant operators and personnel. Regular classes and lectures are conducted, including visual demonstrations. The final lecture of the course is devoted wholly to washing and sanitizing eating and drinking utensils.

This is progressive work by a large city health department, and a method which numerous

health officials maintain is a far more sensible approach to a solution of the problem, common to every large city in the country, than the passage of more and stricter laws. In passing, it is interesting to note that in the Akron educational campaign, all the emphasis is on the use of synthetic detergents for dish washing in place of soap. Soap is not forbidden, but so strongly are detergents recommended by officials that over seventy per cent of Akron eating and drinking establishments today use the newer detergent products.

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MORE new synthetic organic detergent products for household use have come on the market during the past year than in all the years preceding. Their advent has been attended by mixed emotions among old-line soapers and by numerous academic discussions of their possible effects on the future market for soaps. However, this quiet contemplation of the synthetic detergent picture was jarred out of its academic status last month by a series of startling newspaper advertisements for two of the leading synthetic household products. That these newer detergents happen to be produced and sold by two of the oldest and largest soap manufacturers sharpened the impact of the advertising on the soap industry. That soap was damned publicly by references to "no soap scum, no streaky soap film, no soap matting of woolens, no soap fading" was a genuine shock to many soapers.

Whether this latest synthetic detergent advertising has had a greater effect on the consumer or on the soap industry would be difficult to say. Probably, the average consumer does not appreciate the real significance of the copy. But we will hazard a guess that it has hit every soaper squarely between the eyes and elicited more deep thought about the future of his market than anything which has happened since Dewey took Manila. Deep down, he knows that even though they damn soap,—perhaps unnecessarily in the light of the present industry set-up,—the statements are essentially correct and epitomize recent progress in the chemistry of detergency with which he may or may not be keeping pace.

Resentment among soapers was the most common reaction to this damn-soap advertising. It was interpreted as a stab in the back administered to the soap industry from within its ranks. But with this attitude we disagree. In spite of adverse effects on the mind of the consumer, this startling copy may be helpful to other soapers. If it drives home the thought that the industry may be at a crossroads, and soapers had best find out exactly where they are headed, the eventful results can be beneficial. If it awakens some sleepers and turns their thoughts to more than an academic consideration of the future of synthetic detergents, better protection of their market position may be assured.

Basically, the problem of the soap industry today in the light of detergent chemical progress is to see to it that the market is not lost, that no matter what the country uses to wash its clothes or its dishes, be it soap or be it something else, that the soap industry and not some other industry supplies these products. Only flexibility in adapting individual company action to new market trends can solve the problem and keep the market. For indicating this so pointedly in their advertising, we believe that the industry should thank these companies rather than condemn their efforts.

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DEVIOUS are the workings of government and usually beyond the ken of the average business man. Especially is this true when it comes to export licenses. Right now, Greece,—which nation fought throughout the war on our side and took a terrible beating in doing so,—badly needs a small tonnage of powdered pure soap for medicinal and health purposes. An American manufacturer at the behest of Greek officials is ready and willing to ship the soap, lack of which has stymied the production of medicinal items for which the need is desperate. But, there is no U. S. allocation of soap to Greece this year. Neither were there any in 1946. So the powdered soap,—not even a drop in the bucket in U. S. soap tonnage,—cannot be shipped. However, if this manufacturer chooses to ship this same soap to the Belgian Congo, Liberia, French Guiana, Surinam, Afghanistan, West Africa, or Iceland, it might be arranged. But, to Greece? No! Diplomacy? International politics? Probably some of both,—but it still looks stupid!

# NOVELTY SOAPS

By Milton A. Lesser

THE creation of novelty soaps is becoming big business. Formerly considered merely as adjuncts to other toiletries, novelty soaps have now established themselves on their own merits. One could get quite involved in an attempt to explain this phenomenal growth. Basically it would seem to be a response to well placed efforts to lift a familiar, everyday commodity to something above the commonplace, either by improving its appearance or by imparting added conveniences.

A soap may present an element of novelty in that it may differ from the usual run of products in shape, size, odor, color, packaging and, usually, in price. In a newer sense, the novelty may lie in the fact that the product may differ not only in form, but also offer certain conveniences or advantages not associated with ordinary soaps. On this basis novelty soaps may be divided into two general classes. First are the glamorized soaps which can be called "gift" soaps. Second are the somewhat more utilitarian products which may be termed "convenience" soaps. Of course there is a certain amount of overlapping between the two groups. A convenience soap need not be without attraction, and a gift soap may provide specific conveniences.

With ingenuity, as well as a good deal of artistry, brought to bear toward the creation of really novel and interesting effects, soap has found ever-growing acceptance as a suitable gift. It was not so long ago that novelty soaps, chiefly imports, were practically monopolized by women. Today the situation has undergone a radical change to include both sexes and practically all age groups. Soaps specially intended to please masculine tastes have been developed and are finding considerable acceptance. (1) Of course the war has been an important influencing factor. For instance in one quite recent survey (2) of ex-servicemen it was found that about 68 per cent prefer a man's type soap. Cognizant of children's desire to imitate their elders, manufacturers have come out with soaps aimed at the pigtail and short pants group.

The results of these efforts are plainly evident in many of the department and chain stores throughout the country. No longer relegated to the background, novelty gift soaps are being merchandised on counters and displays of their own. More evident is the tendency to sell soap as such in packages specifically designed for the purpose. Manufacturers, however, have not overlooked the advantages of combining soap with other toilet or cosmetic items.

While some manufacturers try to include as many distinctive features

as possible in a novelty soap, others are most subtle in their approach. Some emphasize the delicate fragrance and color of their products, while others, in appealing to the male market, stress the luxury of a big cake of soap with a he-man perfume. In some cases attention is directed to the fact that the soap is superfatted or contains ingredients believed beneficial to the skin. Improvements are constantly being made and new ideas are carefully considered in the hope of obtaining something really distinctive in an increasingly competitive field.

Perhaps more ingenuity and originality has been displayed in the creation of novel shapes than in any other phase of gift soap production. The services of top-notch artists and designers, with a knowledge of both the adaptability and limitations of soap as a medium, have been enlisted by soap manufacturers. The molding of soap into unusual shapes requires special equipment as well as a knowledge of the most suitable soap stock to avoid defects in the finished products.

In the case of gift soaps for women and men, there has been a notable tendency to veer away from the purely novel and to concentrate on shapes that will indicate a quality product. (3) Somewhat more leeway is permitted in the designing of guest size and similar small soap cakes.

Novelty of shape, however, remains a big factor among progressive soap makers alert to new trends and interests. Aside from seasonal holiday products, like soap Santa Clauses and sleighs at Christmas and rabbits and eggs at Easter, these manufacturers also provide replicas in soap of characters made prominent in the news and movies or on the stage and radio. These and numerous other novel shapes are directed chiefly at the younger generation, and include everything from soap animals to automobiles. The encourage young boys to be more friendly with soap, one producer has recently made available novelty soaps shaped like baseball mits and sheriffs' "six-shooters."

Of course adults have not been neglected by novelty soap makers and there are molded products to fit numerous occasions. For example there are such items as a soap decoy duck for the sportsman, a globe for the traveler, dumbells for the reducer and an "eight-ball" for the newlyweds. The possibilities of such novelties seem limited only by the equipment and ingenuity of the manufacturer. Much originality and beauty also enters into the production of small guest-size cakes. In many cases the novel features of the soap are enhanced by appropriate and colorful packaging.

On occasion the shape of a novelty soap is not intended to be merely pleasing or amusing, but to serve a practical purpose. The patent granted to Wallace, (4) for example, describes soap cakes which not only cleanse the body but also produce a massaging and scrubbing action. This is achieved by providing a soap with a roughened or undulating surface. Thus the surface may consist of a series of bumps, ribs, corrugations, suction cups or pockets molded into the soap and so designed as to induce the requisite agitating and massaging effect.

Of interest from the standpoint of convenience and safety for people who like to shower are novel soap cakes with loops of soft cord attached to them. This arrangement permits the soap to be suspended from the neck within easy reach, leaving the hands free and avoiding a lot of fumbling. At the same time, the cord keeps the soap from underfoot, where it can be quite a hazard. Of course, the development of floating soaps was one of the greatest boons for tubbers. No novelty today, though still cited as an advantage in advertisements, it is interesting to note that processes for making floating soaps continue to be improved or new ones developed, a fact evident in several recent patents. (5, 6, 7).

MANY high quality gift soaps, as well as some of the more novel forms bear either an impressed or *bas relief* decoration to lend an added touch of distinction. A number of attempts have been made to devise ways to make the impressions more permanent so that they will persist even while the soap cake is being worn away by use. One newly developed method, which has attracted considerable attention, is described in a provisional British patent. (8) In this process, the letterings or other representations are made to extend deeply into the cake and since they are made by spaces molded or formed in the soap, they will not disappear on rubbing the soap from the surface of the cake. Even if some soap should be washed into the impressions, the difference in texture of the soap in the gaps will still indicate the representation. The lettering may be pressed by a die into the cake to the desired depth. It can be pressed on each side to nearly half the depth of the tablet; the incisions on one side being conveniently offset in relation to the incisions on the other side. However, the lettering can also be done from one side only to nearly the full depth of the cake. Lettering or marking done by such methods persists throughout the life of the cake of soap. Noteworthy is the claim that the cohesion of the tablet as a whole is not detrimentally affected by the process.

The creation of colored designs on soap may be achieved by various printing processes. Soaps carrying pictures, designs, monograms, advertising messages and the like on one surface have been available for several years. In some cases, the imprint disappears after the soap has been used for a short time. In other instances the characters remain until the cake is almost entirely used. Examination of these products usually shows that the persistence of the print depends not so much upon the penetration of the ink into the soap as upon the use of a protective, quite impervious lacquer or other film over the decorated area. The disadvantage of such products is that only one surface provides the requisite soap action, the cake wearing away under the protective film.

An approach to the problem of creating novel, colored, persistent designs in soap without the use of such extraneous devices has been detailed in a recent patent. (9) With the methods given in the specifications it is possible to make soap tablets of various forms and to incorporate two or more colors, thereby improving both

appearance and sales potential. According to one method of the patent, a tablet soap may be produced in such a way as to suggest that a cameo has been inserted into it. For example, one tablet of white soap may be stamped in the usual way, but using a punch or die provided with a cylindrical projection so that the resulting cake has a corresponding recess. Into this recess there is placed and secured by adhesive or water, a second, differently colored tablet of soap, having the same or about the same dimensions as the recess. This second tablet may or may not have a design stamped on it. If it is plain, the tablet may serve as the colored background for a design produced with special cut-outs. By way of illustration, a woman's head in relief, made of white soap, is secured to the colored background so as to suggest that a cameo has been engraved on the soap cake.

Methods for making such cut-outs are given in the patent. Apart from obtaining cameo-like effects, the effects can be varied to yield results comparable to those obtained by appliqué, filagree and inlaying operations. By employing soaps of contrasting colors, or by the use of opaque and transparent soaps, it is possible to obtain really novel and beautiful effects. Methods for obtaining floral and foliar decorations or silhouettes are also suggested, in which case the figures can be punched from ribbons or thin bars of soap. According to the patent it is also possible to insert in a cake of soap designs, letters, numbers or words which will last throughout the greater part of the life of the soap when in use.

AS is quite understandable with gift items, considerable thought and care has been lavished on the packaging of novelty soaps. Wrappings or sheathings for individual cakes have also come into wide use to lend added attraction or to maintain certain desirable qualities. For a number of years, transparent cellulose film, like cellophane, held the field for such purpose. Today, however, they are in competition with newer materials. Especially important is a rubber hydrochloride sheet known as "Pliofilm." A war development, this transparent wrapping and packaging material is waterproof, moisture-proof and vaporproof, and is claimed to be impervious to oils, greases, weak acids and alkalies. For general use, the film is transparent, but it is also available in a range of colors, as well as in translucent, opaque or metallic form. When heated it can be stretched to several times its original area and thus is capable of forming a skin-tight covering. When used for wrapping soap, the extensible film immediately conforms to the shape of the soap. (20) Other novel wrappings for sheathing soap cakes have been patented (21, 22)

In some cases the need for these novelty wrappings, more especially the colorless, transparent kinds, may be obviated by new and improved processes for imparting a high gloss to soaps. The subject has been discussed in the technical literature (23) and means for creating a high gloss have been detailed in a number of recent patents. (24, 25, 26) Of course such developments contribute to the attractiveness and sales appeal of gift soaps.

ALTHOUGH a few products have been available for some time, there has been an upsurge of interest during the last few years in the development of what can be called "convenience" soaps. In the main the second group of novelty soaps comprises individual, single-service products in handy compact form. For the sake of discussion these may be divided into two sub-groups; namely those in which the soap is provided in a disposable medium, and those which are completely utilized during a single washing.

In the first group belong those items in which the soap is dispensed in capsules or similar individual containers, or where the detergent is supplied in an impregnated paper or cloth. An example of the former is available in soap capsules put on the market a few years ago. Each celluloid capsule, about 7/8 inches long and about 1/4 inch in diameter, is said (27) to provide sufficient soap to clean the grimiest hands. Provided in envelopes containing a number of capsules, this convenient product was sold on the basis of its usefulness and convenience to motorists, train travelers, fliers and the like.

Obviously this idea can be further extended. It should be possible, for example, to encapsulate liquid soaps or shampoos to provide single service items. The feasibility of the idea is evident in a popular individual bath oil product as well as capsules of cosmetic creams. Soaps prepared in this way could be packaged very effectively.

Becoming more familiar to the public are paper tissues impregnated with a mildly scented soap. Neat, sanitary and convenient, they are provided as small pads or pocket-size dispensers for personal use or in plastic containers for home, office and factory use. Each tissue or leaf, when immersed in water, produces a lather in the same manner as a cake of soap. Where higher wet-strength papers are used, the paper itself may serve also as a washcloth.

ALTHOUGH in many cases it is merely an adjunct to other novel features, some manufacturers base their claim to novelty largely upon the inclusion of a superfatting agent or other more or less unusual ingredient. It is hardly necessary to go into details on the subject of superfatting, since this phase of soap making has been discussed adequately on a number of occasions. (10, 11) Rather detailed reviews on the use of superfatting agents like lanolin (12) and lecithin (13) have appeared in recent issues of *Soap and Sanitary Chemicals*. Medicated soaps have also received consideration. (14)

Worthy of mention, however, are several methods for incorporating deodorants or antiperspirants into soaps. In an example from one series of foreign patents, (14) it is stated that an antiperspirant soap may be prepared by stirring 3.5 to 5 parts by weight of chromic oxide, 1 to 2 parts of hexamethylene tetramine and 1 part of aluminum acetate into 100 parts of molten soap. The soap is then allowed to harden into shapes of any desired form.

An American patent (16) describes the manufacture of a toilet cake soap, which not only is of good texture and lathering properties, but which also contains sodium bicarbon-

ate as a deodorizing agent. From 10 to 30 per cent of the bicarbonate may be used in admixture with a neutral soap, but the quality of the salt must be regulated so as not to cause crumbling of the finished cake. Incidentally, a recent report (17) indicates that sodium bicarbonate is quite efficient as a deodorant.

Of interest in connection with the addition of special ingredients to soap is a novel process (18) by which bores or perforations in soap tablets are filled with any one of a number of appropriate materials.

Transparent soaps, which have always commanded a position of their own, are rather scarce at the present time. This, of course, is largely due to shortages of alcohol, glycerine and sugar, all of which are used in the production of such soaps. With the growing availability of these raw materials, it may be expected that transparent soaps will again resume their place along side other gift, novelty soaps. In the meantime, some interesting studies on the structure of transparent soap have been reported by McBain and Ross. (19) Their findings should be of interest to the makers of clear soap cakes.

IN addition to established methods for making soap-impregnated paper, new procedures have been developed for making soap sheets. According to one patent, (28) for example, a pair of superimposed sheets of paper with a layer of soap interposed between them is bound togteher to form a unitary structure. The paper used for this purpose must be capable of disintegrating when wet. In another method (29) for making paper tissues for washing, a detergent of the sulfated or sulfonated type is used instead of soap.

At least one progressive manufacturer has produced a disposable cloth impregnated with soap. The product is described (30) as a piece of loosely woven cloth about three inches square which lathers freely even in cold water. Of pertinent interest are convenient applicators of loosely woven cloth incorporating sulfur and a bland toilet soap. When moistened and applied to the skin, a copious foam is produced, evenly distributing the sulfur over the surface of the body. This novel form of medication, already of proved value for treating scabies, (31) became an asset as an effective prophylaxis against chiggers during war time. (32)

In this class may also be considered the cleansing pads which were so popular a few years ago. These consisted of circular pieces of flannel or similar cloth impregnated with a soap solution or a cleansing emulsion. Being already wet, no water is required for their use as cleansing aids. At the height of their popularity, women bought jars of these pads; a few of them being transferred to a plastic compact for the handbag. Working girls particularly found these pads useful for freshening the skin and for cleansing the face at the end of the day, prior to applying fresh make-up.

Though not so much in demand today, it may be of interest to note the composition of typical pad-impregnating fluids. One useful emulsion is prepared from: (33)

| | *Parts* |
|---|---|
| Stearic acid | 1.0 |
| Triethanolamine | 0.4 |
| Mineral oil | 5.0 |
| Alcohol | 10.0 |
| Glycerine | 5.0 |
| Water | 78.6 |

An impregnating solution suggested by Tyler (34) is based on 1 to 2 per cent of fatty alcohol sulfate as the active ingredient. With this in aqueous solution are also dissolved 20 per cent of a hygroscopic agent, such as glycerine, and a small amount of boric acid. Such a solution would be practically neutral in reaction and non-irritating to the skin.

The second class of convenience soaps which are completely utilized in washing and hence have no disposal problem, are provided as soap buds, flowers or as films or sheets. Representing a rather new approach, these soap novelties offer interesting possibilities. Illustrative of the trend are recent patents (35) describing the manufacture of individual brittle soap tablets. These are prepared by adding 3 parts by volume of commercial neutral soap powder to water at 180° to 212° F., plus 1/9 volume of an aqueous solution containing 2 parts of Irish moss and 1 part of gelatin. The mixture is whipped until it becomes a mass of minute air cells, yet stiff enough to retain air without subsiding. It is then dried in small portions. The mass may be shaped into elongated buds with a velvety appearance and of uniform structure. Such products have sufficient cohesion to permit packing and shipping without breaking. On being used they dissolve completely upon the application of water without leaving a residue.

PROGRESS in another direction has been directed toward the production of cleansing films or sheets. Indicative are flexible sheet materials suitable for detergent purposes described in a process patented a few years ago. (36) In a basic example, a warm solution of gelatin is prepared with water and to this is added an aqueous solution of either hard or soft soap. The solution is filmed and allowed to dry. The end product is a sheet or film of gelatin and soap which is readily soluble in water and forms a good lather. These sheets may be wound in rolls for hand or machine use, or they may be cut to convenient size for packaging.

If desired, an adjunct material like an antiseptic, deodorant, skin conditioner, perfume or the like may be added to the initial gelatin-soap solution. If more than one material is to be added, it is preferable that individual gelatin sheets be formed with this substance and that the several films be laminated together, with the soap sheet outermost. Thus a combined product might consist of a base sheet containing a skin conditioner. On either side could be placed a film containing an antiseptic, while the outer two sheets would carry the soap. Instead of gelatin, other water-soluble film-forming materials may be used; these including agar, pectin, gum tragacanth or "aqueous resins."

Other methods described in European patents (37, 38) utilize water-soluble, film-forming cellulose derivatives. These cellulose ethers are mixed with detergents such as a mixture of sulfonates of fatty alcohols or their derivatives to form a jelly. This is allowed to dry so as to form a film

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# SYNTHETIC DETERGENTS

## Questions answered in regard to their future and their competitive position in the market for soap products

**By**
**George L. Parkhurst***

President,
Oronite Chemical Company

IN their early development, synthetic detergents primarily found industrial rather than household application. This was due in large measure to the fact that detergents were originally, and in many cases still are, much more expensive than ordinary soaps and, therefore, found their application in fields where ordinary soaps were not completely satisfactory. However, the field of synthetic detergents is one of rapidly increasing importance, and this importance, in terms of volume at least, is already primarily in the field of household rather than industrial application.

The principal question is to what extent can synthetic detergents successfully compete with soaps in the field of household applications in the future when there will be an abundance of natural fats and oils available at reasonable prices for soap manufacture. The use of washing compositions of all sorts in the household field has not yet reached its peak. That field will expand domestically, and to a much greater extent, in the foreign market. I venture to predict that, in spite of our present high level of industrial prosperity, the use of soaps and other washing compounds will continue to increase on a per capita basis even after supplies are freely available. Certainly, if we are successful in building a better world, the per capita consumption of washing compositions in most of the rest of the world should rise rapidly. Thus, synthetic detergents can, in a very considerable measure, continue to expand in the field of household applications, as well as in the industrial field, without detracting in too large measure from the markets which will be available for soaps when there is no longer a shortage of raw materials for soap manufacture.

Synthetic detergents are, of course, competitive to soaps. There is, and will continue to be, real competition between these two broad classes of materials. The most important question, as I see it, is the extent of that competition, the extent to which the synthetic detergents can capture markets which would otherwise be available to soaps. Opinions on this subject differ because there are a great many unknown factors. Synthetic detergents as a class (or at least the more important members of that class) have an important characteristic in that they do not form a curd or scum in hard water. Thus synthetic detergents first entered the field of household applications primarily in hard water areas where soap was at a disadvantage. These hard water areas will continue in the future to be the most important markets for synthetic detergents for household use. So far as I know, synthetic detergents have never competed on an important scale with soap in soft water areas when soaps were freely available.

### *Can Detergents Compete?*

THE first question as to the extent that synthetic detergents can successfully compete with soap is: Can they compete in soft water areas where soap does not suffer the disadvantages inherent in its use in hard water? My personal conviction is that they can. I believe that synthetic detergents will be found superior to soap even in soft water areas for washing dishes, wools and fine fabrics and in other washing operations — with the exception of heavily soiled cotton—even in soft water regions. I believe that they can compete both on quality and on price, even when fats and oils drop in price to whatever values it is reasonable to conjure up for the future. One advantage which they have in this connection is that a greater quantity of builder (compounding materials) can be incorporated in a synthetic detergent than can be used in soap, without impairing its quality. In fact, synthetic detergents as a class are improved in quality by the addition of builders, even though the active ingredient may be reduced to as low as 20 or 30 per cent of the total composition.

The second question is: Are synthetic detergents able to do as satisfactory a job as soap in washing heavily soiled cotton, in particular, the tighter-woven and harder types of cotton? As far as I know, synthetic detergents have not yet equalled the per-

* Based on an address by Mr. Parkhurst before the Association of American Soap & Glycerine Producers, New York, Jan. 22, 1947.

formance of the best soaps in washing heavily soiled cottons except in hard water. But the quality margin between soaps and synthetics in washing such cottons is being narrowed rapidly. I believe that low-cost synthetic detergents will be produced before too long which will not only equal but will excel the best of soaps in washing heavily soiled cotton, even in soft water.

The third question is whether or not synthetic detergents can compete with bar soaps, heavy duty soaps and specialized soaps of all kinds. I see no reason why satisfactory bar toilet soaps cannot be made from synthetic detergents. (In fact, such soaps were used by the armed forces in the late war for washing in salt water.) The problem of washing cotton, as well as the problem of putting these products into bar form, constitute the main obstacles. How soon those obstacles will be overcome is anyone's guess.

### *What Extent of Future Use?*

THE fourth question is: How much synthetic detergent will be used in the future? The industry has been beset with shortages throughout the war, and shortages are still with us. Benzene, naphthalene, chlorine, caustic soda, and the builders (which synthetics require in large volume) are all in short supply. Manufacturing facilities have taken distressingly long to erect or convert. However, all these shortages are transient. The petroleum industry will solve the hydrocarbon raw material problems. The chemical industry will solve the other raw material prolems.

It has been estimated that the figure for the current market for synthetic detergent is approximately 250 million pounds per year and that the market which these materials will attain in the next few years will lie in the range of 500 million to 800 million pounds per year. My own estimate is that within the next few years the synthetic detergents, as a group, will reach and quite probably substantially surpass a volume of one billion pounds per year.

Incidentally, my company is sufficiently confident of the future of these materials so that it is making definite plans to bring its production—within a relatively few months, I hope—to something well over a quarter of the figure I have mentioned for the ultimate market, and is looking ahead towards a manufacturing potential of about one-third to one-half of that billion pound figure. This material will not be supplied in final form for household use. Much of it will, as we see it, be marketed in the form of intermediates which will leave major manufacturing steps for the soap industry.

### *Soap Industry as Marketer*

IN conclusion, perhaps a few words are warranted on the relationship of the two main classes of synthetic detergents, namely those made from fats and oils and those made from petroleum. It is my belief that in terms of quantity and in terms of cost, the synthetic detergents made from petroleum will definitely have the edge—so far as the large general utility markets are concerned—and probably the edge in other markets as well except for certain limited markets where specialized types of synthetics have recognized advantages.

So far as my company is concerned, its policy can be simply stated: we look upon ourselves as suppliers to the soap industry and not as competitors to the soap industry in a market sense. We do not desire unnecessarily to enter into the distribution of household detergents in packaged form. We would much prefer to leave the soap business to the people who know the soap business. We look upon ourselves more as supplementary to the fat and oil industry rather than as competitors of the soap industry. We would like to present you with products of continuously improving quality and declining prices, and we would like to have you accept them on their merits and take over the job of introducing them to the market.

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## Soapers Called Unfair

Charges were recently made by Clement J. Dowling, president of the Retail Druggists' Association, St. Louis, that chain, department, syndicate, and super stores have received special advertising allowances, secret discounts, and rebates which make it possible for them to sell soap at retail for less than the cost to the wholesaler. "This unfair practice produced for them an enormous volume and the figures were used to demand and procure large amounts of soap during the shortage." The "monopolies," according to Mr. Dowling, had "warehouses full of soap" which enabled them to hold special sales. When soap prices advanced, "these stores made large profits on soap bought at lower prices," he charged. "During the entire shortage", he said, "this favored group received enormous shipments of soap while the small retailer got little or none." Mr. Dowling's charges were sent in a letter to FTC, Congressman Patman, the small business committees of the chambers of commerce of St. Louis and Washington, D. C., the National Association of Retail Druggists, and city and state pharmaceutical associations.

## Review Soap Outlook

*Food Topics,* a trade publication issued in New York and circulating among retail grocers, recently issued a mailing piece outlining some of the reasons for the current soap shortage, and viewing the future outlook for soap supplies. Conclusions reached were as follows:

(1) Consumer demand for soap is the largest in history—because 8,310,000 *more people* want soap today than in 1941; they have more money to spend for soap as well as other things; the military services have educated millions to greater cleanliness habits. The growth of detergents is expected to ease the pressure for soap—but not in the near future.

(2) Available materials for use in soap manufacture are the tightest in years.

(3) Freed from O.P.A. controls, these materials (in a highly competitive market) are zooming skyward as to price. At the moment, prices for such materials are 2½ times higher than they were under O.P.A., thereby forcing manufacturers to raise prices and grocers to raise theirs.

*Properties and uses of*

# SURFACE-ACTIVE CATIONS

**By Robert R. Ackley***
Onyx Oil & Chemical Co.

IT is frequently a good policy to review the general properties of certain chemicals, paying particular attention to those properties which may be responsible for applicability in a specific field. In this manner it is sometimes possible to gain a clearer view of the mechanism of their action. Additionally, new applications for old materials may be uncovered by a knowledge of their behavior in apparently unrelated fields.

It would appear that a review of the general properties of cationic surface active agents is in order at this time. This is particularly the case in view of the rapidly expanding use of these materials for antibacterial purposes. It is perhaps especially important that the present indecision regarding procedures for evaluating germicidal effectiveness be considered in the light of what is known of their behavior in simpler systems not complicated by the presence of living cells.

Cationic surface active agents are, of course, those materials which dissolve in water, concentrate and orient at interfaces, and ionize in such a way that the cation includes a hydrocarbon chain, generally containing from eight to twenty-five carbon atoms. These compounds are by no means new. In 1911, Hunt and Taveau (1) prepared such a material by the interaction of palmitic acid with choline chloride, and included it in a study of the effect of choline derivatives on blood pressure. In 1913, Reychler (2) prepared cetyl triethyl ammonium bromide and related compounds, and studied some of their colloidal properties. For some time thereafter, these compounds were of considerable interest to investigators in the field of soaps and detergency. Around 1930 compounds of this class were utilized for improving the fastness of dyed fabric to water, and shortly thereafter the germicidal properties of selected members of the family were described (3).

TYPICAL SURFACE-ACTIVE CATIONS

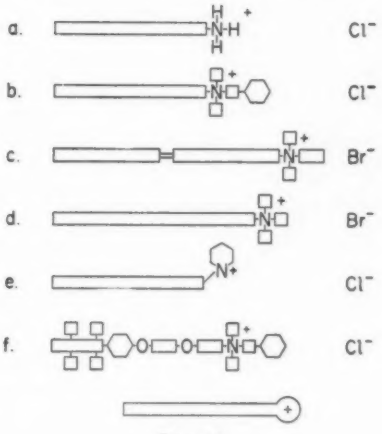



Figure 1

REACTIVITY OF SURFACE-ACTIVE CATIONS

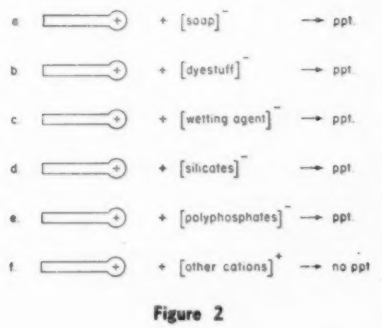



Figure 2

At about the same time it was found that surface active cations were readily adsorbed onto cellulose from very dilute solutions, and that fabrics were rendered very soft and smooth by their use. This was the basis for the first large commercial usage of such compounds, as literally millions of miles of fabrics have been processed with the so-called "cationic finishing agents" or "cation-active-softeners". It is interesting to note that the effect imparted by the use of these materials persists, even after repeated washing.

Subsequently, salts of the amines derived from cocoanut oil have been used commercially on a large scale in flotation operations.

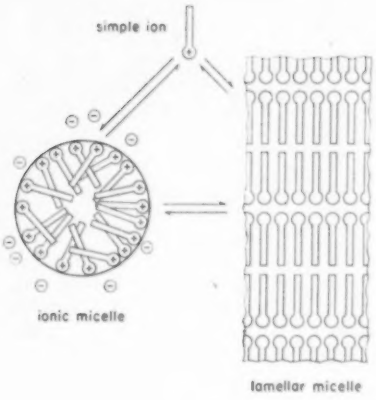
Some typical surface-active cations are shown in Fig. 1. The rectangles, drawn to scale, represent the number of carbon atoms in the various chains, and present an approximation of relative chain lengths.

In addition to those compounds illustrated, literally thousands of cationic surface active agents are described in the technical and patent literature, and several of these are in commercial production. The general shape of the members of the class may be represented by the diagram at the bottom of Fig. 1., which illustrates the hydrocarbon chain and positively charged polar group common to the family.

Some of the simpler reactions of surface active cations are shown in Fig. 2. It will be noted that the reactions shown by these compounds are directly opposite to those of soap. This dissimilarity in reactivity, together with the otherwise soap like properties, of foaming, surface tension depression, etc., is responsible for the term "invert

* Before Natl. Assn. Insecticide & Disinfectant Mfrs., New York, December 4, 1946. The author is now connected with Richard Hudnut, New York.

**Figure 3 — States of Surface-Active Cations in Solution.**




soap", sometimes employed in describing such compounds.

The precipitation reactions of invert soaps are approximately what would be expected for monovalent cations of molecular weight around 350. The precipitates formed by interaction with soap, as well as with many dyestuffs are soluble in organic solvents; this property has been utilized in the preparation of spirit-soluble colors.

Quaternary ammonium compounds of the type illustrated in Fig. 1 are generally stable against most reagents. They may take part in double decomposition reactions to form salts. They are normally not decomposed by mild oxidizing conditions. They are resistant to boiling, and are thermally decomposed only at very high temperatures. Decomposition occurs somewhat more readily under strongly alkaline conditions. With hypochlorites they react to form chloramines, which may be decomposed by heating.

Metathetical reactions with proteins will be discussed in detail later in the paper.

The observation of precipitates is difficult when surface active agents are involved. When conditions for solubility are exceeded, aggregation to form micelles may take place. Fig. 3 shows the forms in which surface active cations are considered to exist in solutions. As the solubility is exceeded, simple ions may associate to form ionic micelles, in which the polar portions of the ions are assumed to be oriented on the outside of a sphere, the diameter of which is approximately twice the length of the ion, surrounded by counter-ions of opposite charge. At still higher concentrations, lamellar micelles are assumed to form, in which alternate rows of molecules are arranged as shown. The micellar structure has been shown by X-ray studies (4). McBain (5,6) has shown that cationic surface active agents in the micellar form solubilize water insoluble dyestuffs in a manner analogous to soap.

Ralston (7,8,9) as well as Scott and Tartar (10) has studied the conductivity and transference numbers of a series of surface active cations. Fig. 4. presents conductivity data from Scott and Tartar. The sharp breaks in the conductivity curves represent the critical concentrations for micelle formation, although other investigators have assumed that ionic micelles exist to some extent below the critical concentration. The critical concentration is usually lowered by the presence of electrolytes, and is raised by increase in temperature.

Surface tension measurements have been made on several surface active cations by various investigators (11,12,13). Adam and Shute (12) have studied the time required for the surface tensions of such solutions to attain equilibrium values. Fig. 5. from their data shows that the time required increases as the concentration decreases. Qualitatively, the concentration above which equilibrium is reached rapidly is of the same magnitude as the critical concentration for micelle formation. The rate of attainment of equilibrium is considered to be a measure of the speed with which the ions reach the interface and become oriented. It must not be considered, however, that such orientation is always as slow as would be indicated from

CONDUCTIVITY CURVES FOR SURFACE-ACTIVE CATIONS

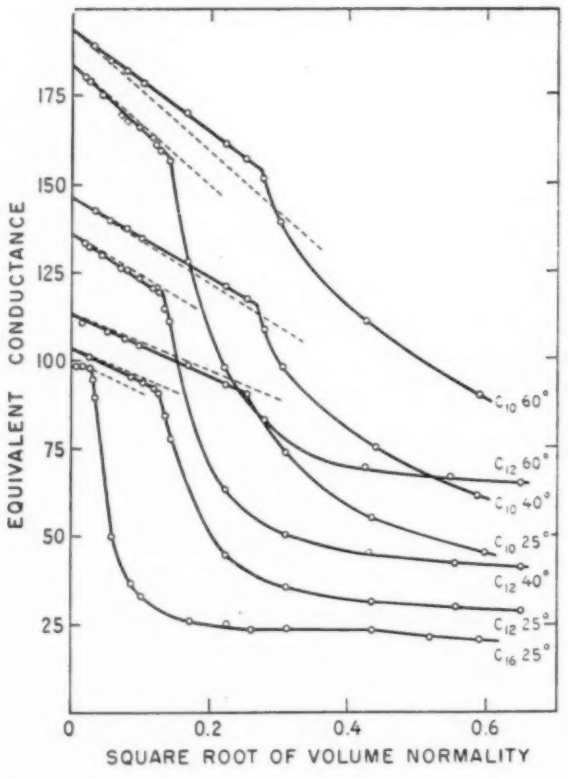



**Figure 4 — Equivalent conductance of decyl —, dodecyl — and hexadecyltrimethyl - ammonium bromide solutions. Subtract 10 from ordinate for decyltrimethyl - ammonium bromide. (Scott and Tartar.)**

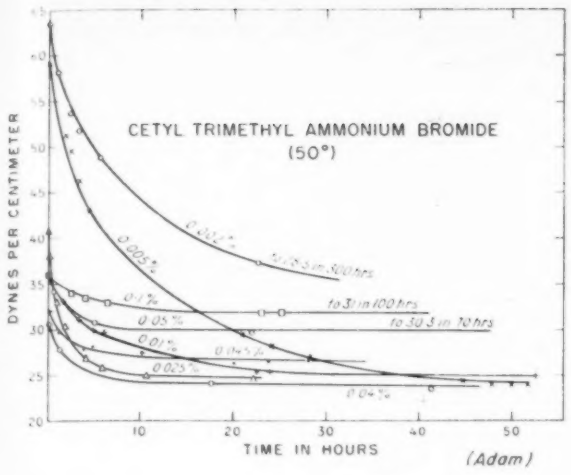



**Figure 5—Effect of Time on Surface Tension of Surface-Active Cations.**

Fig. 5, for Alexander (13) has shown that the time lag is eliminated if the rate of attainment of uniform interfacial tension with "Nujol" is determined. Thus, the rate of orientation is dependent upon the nature of the interface. This orientation is presumed to be the important step in the interaction of surface active cations with solids or with colloidal particles.

Tensiometric methods for determining the concentration of solutions of surface active cations have been suggested (14). As a surface-active cation is titrated with a surface-active anion, the surface tension gradually increases, a maximum being reached when an equivalent amount of anion has been added.

### *Reaction With Proteins*

THE reactions of surface active cations with proteins and related compounds are of great interest as a possible source of information which may throw light on the antibacterial activity of cationic germicides.

In 1939 Anson (15) showed that proteins may be denatured by surface active agents of either anionic or cationic type. At the isoelectric point surface active agents prevent precipitation. It had previously been shown (16) that denaturation of proteins is accompanied by unfolding of the native protein molecules and transformation into a fibrous state. Recently proteins denatured by the action of surface-active agents have been spun into fibers (17), and the structure, after removal of the surface active agent with solvent, was found to be linear, resembling B-keratin (18). It appears that the amount of surface active cation required to produce denaturation is less than the amount which produces precipitation.

Fig. 6, taken from the data of Kuhn and Bielig (19) shows the precipitating effect of a surface active cation on various proteins. In the case of albumin, very low concentrations of surface active cation were found to liberate-SH groups. Only in the case of the highly basic protein, salmin, did they fail to form precipitates. When freshly formed, these precipitates could be redispersed in excess agent, and the resulting dispersions were not coagulated by heat. These investigators concluded that proteins could be precipitated only when they were in the form of anions, i.e., on the basic side of the isoelectric point. Schmidt (20) however, has shown that in the presence of neutral salts precipitation takes place more readily and may occur at lower pH values. Fig. 7, from his data, shows the relative amount of casein and of hemoglobin remaining in solution (containing approximately 0.8 per cent salt) at various pH values when alkyl dimethyl benzyl ammonium chloride was added.

The absorption of surface active cations by wool has also been studied (21). In accordance with the results of Kuhn and Bielig, maximum absorption was found above the isoelectric point.

Gilbert and Rideal (22) have shown that the reaction of ions with proteins is related to the intrinsic affinity of the ions. Surface active ions in general appear to possess high intrinsic affinity for proteins, depending upon the specific system being studied.

Valko and Dibblee (23,24) found, with *E. Coli,* that the bacteria behaved as though the equivalent weight of the dry cell material were approximately 600, or in the range of the equivalent weight of many animal proteins. Fig. 8 shows their results, obtained by determining the amount of surface active cation present in solution after removal of cells by centrifuging. The saturation concentration is very close to the dilution at which the organism is killed in 5 minutes.

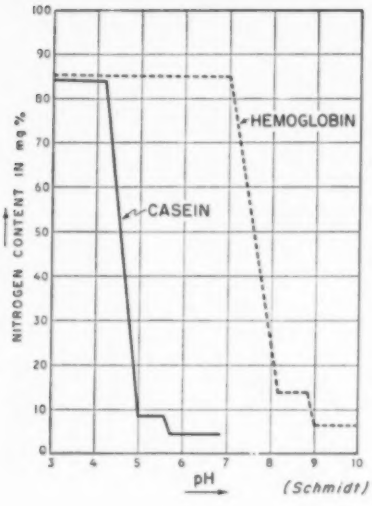
In addition to their studies on the precipitation of native proteins,

**Figure 6 — Protein Precipitation By Surface-Active Cations.**

| Protein | Isoelectric Point(pH) | Precipitation Reactions | | |
|---|---|---|---|---|
| | | Acidic | pH 5-6 | Alkaline |
| 1. PEPSIN | 2.7-3.0 | – | + | + |
| 2. CASEIN | 4.6 | – | + | + |
| 3. GELATINE | 4.8 | – | + | + |
| 4. EGG ALBUMIN | 4.9 | – | + | + |
| 5. SERUM ALBUMIN | 4.9 | – | (+) | + |
| 6. UREASE | 5.0-5.1 | – | + | + |
| 7. OXYHEMOCYANIN | 5.1 | – | + | + |
| 8. YELLOW FERMENT (from yeast) | 5.2 | – | – | + |
| 9. TRYPSIN | 5.0-8.0 | – | – | + |
| 10. INSULIN | 5.3-5.8 | – | – | + |
| 11. CATALASE | 5.6 | – | – | + |
| 12. PSEUDOGLOBULIN | 5.8 | – | – | + |
| 13. OXYHEMOGLOBIN | 6.7 | – | – | + |
| 14. GLOBIN | 8.1 | – | – | + |
| 15. SALMIN | 12.0-12.1 | – | – | – |

*(Kuhn and Bielig)*

Figure 7—Effect of pH on Precipitation of Proteins By Surface-Active Cations.




Kuhn and Bielig (19) investigated other reactions of possible biological significance. They found that symplexes, such as the echinachrome symplex, are split by surface active cations to give dye components and free protein. The liberation of colored material was independent of the precipitation of the protein. Chloroplastin solutions were split into chlorophyll and carotenoids by surface active cations but not by surface active anions. Beta carotene was similarly prepared by the action of surface active cations on carrot juice. Lycopene was extracted from tomatoes in the same way. In each case, it was possible to extract the colored constituent with solvent after the treatment with surface active cations.

The prosthetic groups were not split from chromoproteids, in contrast to the action of surface active anions (ovoverdine was an exception) but precipitation occurred, particularly from slightly alkaline solutions. Thus ferritin is totally precipitated, and when catalase is precipitated from alkaline solution its ability to decompose hydrogen peroxide is destroyed. In the absence of surface active cations alkaline catalase will decompose peroxide.

Genes were also found to be affected by surface active cations. In some cases the mutants were the same as those produced by X-rays.

Other investigators (25) have found that surface active cations will extract visual purple from the retina of the eye and interfere with complete bleaching of the solution by sunlight.

As special cases of the reaction with proteins, the inactivation of viruses is of interest. Pfankuch and Kausche (26) have shown that 0.4 per cent solutions of tobacco mosaic virus are inactivated by the concentrations of surface active cations which produce precipitation or turbidity. The ability to inactivate the virus increased with increasing length of the surface active cation.

In contrast, Krueger (27) and co-workers found that surface active cations did not inactivate 5 per cent solutions of types A and B influenza virus when the surface active cation was present in a dilution of 1:10,000. Higher concentrations were not investigated due to the formation of a precipitate. In order to be comparable with the work of Pfankuch and Kausche, higher concentrations of cation would have to be allowed to act on smaller amounts of virus, in accordance with the stochiometric relationships observed in the reaction of surface active cations with other proteins.

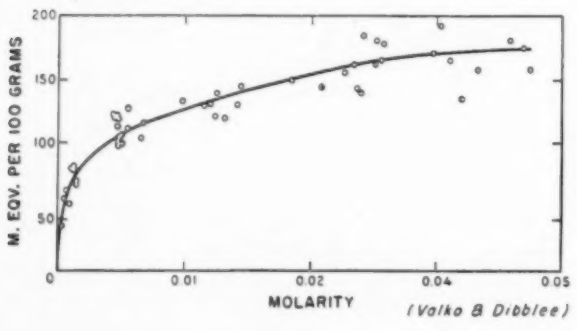
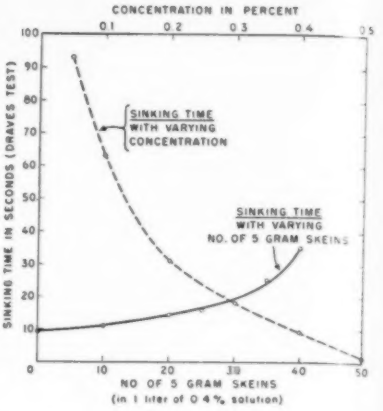



Figure 8—Adsorption of Dimethyl- Dodecyl-Benzyl-Ammonium Chloride By E. Coli.

Figure 9—Wetting-Out Properties of Alkyl Dimethyl Benzyl Ammonium Chloride.


CONCENTRATION IN PERCENT
SINKING TIME IN SECONDS (DRAVES TEST)
SINKING TIME WITH VARYING CONCENTRATION
SINKING TIME WITH VARYING NO. OF 5 GRAM SKEINS
NO. OF 5 GRAM SKEINS (in 1 liter of 0.4% solution)

## Cytolytic Activity

IT has been shown (28) that surface active agents exert a pronounced cytolytic effect on cells, such as red blood cells. Shelanski (29) has observed lysis microscopically when protozoa and nematodes were in contact with very dilute solutions of certain surface active cations.

Hotchkiss (30) has observed that bacteria in contact with killing dilutions of surface active agents undergo lysis as shown by total loss of their soluble nitrogen and phosphorus. After centrifuging, the amount of soluble nitrogen and phosphorus lost by the cells is found to be as great as that obtained by extraction with trichloroacetic acid. This effect is not pronounced when bacteria are killed by other types of agents. He concludes that the first step in the attack on bacterial cells is the interaction of surface active ions with oppositely charged sites on the surface of the bacteria. As a second step, there may be damage to the cell membrane, with release of soluble nitrogen and phosphorus. After cytolytic injury, autoysis sets in and the cell constituents break down enzymatically. In some systems, penetration of the surface active ions may interfere with the enzyme systems.

Interaction of surface active ions with cells is not necessarily an

(Turn to Page 93)

# The Small Soap Maker...

**his chance for survival in the competitive struggle with larger soap manufacturers lies in specialization, says J. M. Vallance.**

THE most significant current development in the technique of soap manufacture would seem to be the current trend towards the adoption of continuous processes. Undoubtedly continuous hydrolysis and saponification processes have come to stay. Their future is exceptionally promising, insofar as large-scale output is concerned. The larger firms are already enabled, by utilizing certain continuous methods (notably those perfected in the United States over the past decade), to cut down soap production costs to an absolute minimum.

All this signifies a proud achievement—to the industry as a whole. Yet it just as certainly spells eventual ruin to the smaller soap maker, if he merely remains content to play the game of slavish imitation and follow-the-leader. No longer will he be able to compete because of lower overhead costs. He must either compete with the larger concerns on their own terms, or else completely reorientate his existing marketing policy.

The surface of this problem was skimmed in this magazine, over a year ago, by myself and a well-informed collaborator. (1) We thought then, and we are now still more convinced of the commonsense of our attitude, that the only correct answer to the problem is: intelligent specialization. That, incidentally, is the way that things are beginning to shape up in Britain.

To be brief, I would suggest that the future of the smaller soap maker can be approached only on one of the following broad lines—which may perhaps be called long-term policies:

1. The small soap maker may decide to continue for as long as he can in the prevailing fashion. This is still possible in the United Kingdom because of the existing soap shortage and the system of oil and fat allocation, which in effect affords him temporary economic protection and a seller's market. His troubles will really begin when the general supply situation eases and the larger concerns' continuous process plans come into full operation. He will then most certainly find that his framed, broken down and milled soap powder cannot compete with the continuously sprayed type; nor will his framed, chipped, dried amalgamated, milled, plodded and stamped toilet soap be able to compete with the continuously produced, controlled f.a. content, framed and stamped toilet soap of the future. Having made no provision for this day of reckoning, what will he do? To that question there appears to be no satisfactory answer.

2. An alternative policy, strongly recommended by certain consulting chemical engineers who have participated in the development of continuous processes both in England, and in the United States, is that some of the smaller concerns should get together to finance research into the development of competitive processes on an economically justifiable but rather smaller scale. One obvious drawback to the general acceptance of this plan is that the smaller concerns have not hitherto shown a particularly keen appetite for collaborative action or merging their individual identities; if they had, they would not still exist as independent small units. Secondly, it is by no means certain that a truly competitive process of the proposed smaller scale type would prove successful in practice. For any given manufacturing process there is, of course, an optimum size of output for maximum efficiency—but whether that "optimum size" is that envisaged by the pioneer large concerns or by our friends the consulting engineers under reference,

is a matter that cannot be discussed in the scope of the present article.

3. The third and, to my way of thinking, the most satisfactory long-term policy, is that which aims at carefully contrived specialization. One such approach might mean, for example, that the manufacturer would make a preliminary close study of the markets and then decide, as a result of this, to produce some new line—such as a shampoo, disinfectant or insecticide. In his product he might make use of his own soap, together with the usual alkalies, solvents and ancillary materials. To a major extent the new line would probably fit in with his existing material purchases, plant processes and marketing policy. Then, if the cost of competing on actual soap manufacture became too high, he could switch over more readily to the role of soap "converter," in much the same way as do those existing cosmetic firms who purchase soap chips ready-made for subsequent conversion to high-priced, specially perfumed and specially advertised toilet soaps.

The corresponding short-term policy involves the keeping of machines, processes and general developments as up-to-date as possible. It involves the careful study of advertising and trade paper information. It further involves unremitting laboratory experimentation with non-soap materials of many types, in order to decrease the firm's dependence upon a mere handful of highly competitive materials. (The smaller soap maker in the United Kingdom has long been dependent upon monopoly-controlled oils and fats on the one hand and monopoly-controlled alkalies on the other—a prospect that becomes decidedly unpromising if the one remaining factor of overall production costs shows itself at a disadvantage). Envisaging a new product, the works chemist must always aim at outwitting possible restrictive developments affecting *all* raw materials, a desideratum that in turn demands close acquaintance with the relative costs and potentialities of a wide range of wetting, dispersing and emulsifying agents, inert and alkaline builders, solvents, abrasives and so on.

**Based on the experience of a number of soap makers in Great Britain, the author suggests a number of profitable sanitary specialties which the smaller soap maker might well consider adding to his line**

THE following suggestions are offered largely as the result of developments that I have already witnessed in Britain. Probably some of them will not apply nearly so aptly in the United States, but they may perhaps assist in stimulating thought on the subject of specialized soaps and allied products.

My first notes deal with specialized cleansers. A good way to consider this problem is to start off either with a special requirement (e.g. to clean lavatory or toilet bowls) or else with the special capabilities of a relatively unexploited raw material. Conversely, there is little point at this stage in toying with the idea of a general-purpose detergent composed merely of soap and soda. There are already too many of these on the market.

The first man in Europe to utilize nitre cake as the base of a widely-advertised *Lavatory Bowl Cleaner* made a considerable fortune before finally selling out to larger interests. Nitre cake, or sodium acid sulfate, industrial by-product in the manufacture of nitric acid etc., is one of the most effective cleaners of this type. Although soap itself scarcely enters into the composition of these important sanitary preparations, the soap maker is well placed to make and also to market them. On the technical side, close acquaintance with the properties of the various alkalies and oxidizing agents is a very definite advantage, and one that can be further enhanced by studying (a) the chemistry of stain removers and (b) the materials used in sewage and water treatments. I have already mentioned sodium bisulfate, which of course is additionally used in the disinfecting (anti-typhoid treatment) of potable water. The alums are also constituents of lavatory bowl cleaners, because of their precipitating and deodorizing action. Soda ash, trisodium phosphate, sodium sesquisilicate, sodium perborate, sodium pyrophosphate, potassium carbonate and binoxalate, and various ammonium salts, etc. are all possible ingredients of specific formulations. Variations may be made on the following type of formula:

| | *Parts* |
|---|---|
| Sodium acid sulfate | 45 |
| Soda ash | 20 |
| Aluminum sulfate | 15 |
| Sodium perborate | 10 |
| Sodium pyrophosphate | 10 |

Sodium perborate is of considerable utility in helping to remove stains of an organic nature. The bisulfate and pyrophosphate both assist in loosening and sequestering the insoluble lime and magnesium soaps that, in hard water districts, are invariably present in encrusted bowl deposits. Soda ash, despite its valuable water-softening and detergent action, is of little use alone, but requires to be supplemented with more active agents, capable of splitting up the film of mixed organic and inorganic matter and precipitating it. Bleaches and disinfectants are also useful. Sodium sesquisilicate cuts grease, etc., effectively, while the pyrophosphate is particularly efficient in the presence of

colloidal matter. Simple mixtures of soda ash and caustic soda have been suggested, but are not so easily handled or so efficient in practice as suitable compositions of the type indicated.

A good lavatory bowl cleaner, in addition to being fairly readily soluble in cold water, should be relatively safe and easy to handle. Excessive causticity, toxicity and hygroscopicity are to be avoided. The product should store well in the usual cylindrical large-aperture metal canisters, without exhibiting reactive or caking tendencies. These requirements virtually rule out some otherwise interesting raw materials, including caustic soda, sodium hexametaphosphate and some of the more highly toxic disinfectant materials. Some of the inferior lavatory cleaners are of a hopelessly mild character, based on soda, common salt, etc.

SINCE the end of the war, there has been an extraordinarily keen demand in the United Kingdom for *Household Bleach*. Though used chiefly to eke out the soap ration or to bleach dark "black-out curtains" (preparatory to dyeing them in brighter shades), these bleaches are of considerable versatility and find many other domestic applications, being useful for cleaning kitchen tables and floors, baths, sinks, lavatory pans, linoleum, china and glassware. They may also be employed, in outlying rural districts, for disinfecting and deodorizing chemical lavatories. In constitution they may be based on peroxy compounds, ammonia, etc., but are more commonly formulated on the classic lines of Javelle and Labarraque waters, i.e. their chief active ingredient is chlorinated lime. Manufacturers interested in the possibility of marketing an improved product of this type are advised to consult the National Formulary of the American Pharmaceutical Association and similar standard sources, where they will find several possible starting points for their experiments.

The chlorinated lime content will usually run from six to ten per cent, together with approximately the same quantity of soda ash, sodium bicarbonate, potassium carbonate, or suitable alkaline mixtures; the balance being water. The solution is made up, allowed to stand for several days, and then filtered. Sometimes about two dr. of hydrochloric acid to the gallon of solution is added, in order to increase activity by partial liberation of chlorine. Obviously all such additions must be carefully made and controlled prior to bottling.

One of the most valuable of all household cleaners, apart from soap and scouring powders, is that popular revival from the past—*Household Ammonia*. Basically a solution of ammonia in water, it usually contains, in addition, one or more of the following ancillaries: soap, oleic acid, potassium or sodium carbonate, lime water, soluble silicates, alcohol — and even, occasionally, traces of saponin etc. While cloudy ammonia is still popular, there is also a considerable vogue for a brand consisting of a crystal clear solution, lightly tinted with ultramarine blue or other alkali-fast dye. A good cloudy grade should be free from curdling, while an equally good clear grade should be formulated as effectively as possible to minimize the reaction of ammonia with the silicate of the glass bottle container.

For further details I cannot do better than refer the reader to standard text books and to the article by D. D. Catts on "Household Ammonia" published in a previous issue of SOAP AND SANITARY CHEMICALS. (2) Mr. Catts' article contains some valuable data on official regulations, standard strengths, common uses, costs and so forth. The author also points out that ammonia has a chemical action on copper, zinc, tin, monel metal and a number of other metals. Iron or steel are not affected by ammonia in any concentration. Equipment for holding ammonia solutions can be constructed of iron, steel, stoneware, glass, or rubber. Galvanized tanks or piping are to be avoided. Measuring vessels should be of iron or enamelware. Mixing tanks should be of iron which has previously been scrubbed clean of rust. Stoneware may also be used. Piping should be of black iron or rubber. Valves must be of iron. For convenient bottle filling by hand some bottlers use a flexible rubber hose and a "pinch cock" which squeezes off the liquid flow. Special semi-automatic aluminum nozzles are also available. Pumps must be free of bronze or brass parts. Bottle filling machines should be free from copper alloys.

*Liquid Lightning Cleansers* also have their supporters among the trade and public. They may range from modified, diluted liquid soaps to solutions of alkalies and synthetic wetting agents or, as in current practice, they may be based largely or solely on solvent mixtures. In other words, they are complementary to ordinary domestic cleaners and in no way competitive with them. As stain removers they perform a very useful function, and can additionally be used to clean hats, clothes, gloves, furs, jewelry, glass, taps, telephones etc. The most popular brand now marketed in the United Kingdom is a straight mixture of non-inflammable solvents — principally trichlorethylene. Other possible constituents of this type include carbon tetrachloride, methylene chloride, cellosolves, etc., together if desired with relatively small amounts of inflammable solvents (e.g. 80 parts trichlorethylene, 15 parts methylene chloride or butyl cellosolve, five parts amyl acetate or benzol). Of rather more specialized interest are ethyl acetate, alcohol, cyclohexanol, methyl cyclohexanol, tetrahydrofurfuryl alcohol, tetrahydronaphthalene and kerosene. Two published articles on Stain Removers will prove helpful to manufacturers interested in Lightning Cleansers. (3 and 4).

It will be noted that certain variations on the foregoing theme, involving combinations of solvents with ammonia, soaps and water, are in reality dry cleaning soaps.

*(To Be Concluded)*

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(3) Davidsohn, J. "Stain Removing Preparations." *Soap, Perfumery and Cosmetics.*" June, 1940.

(4) Lesser, Milton A. "Stain Removers." *Soap & Sanitary Chemicals*, March, 1946.

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# TRADE NEWS. . . .

## Soap Assn. Closes Office

The Washington office of the Association of American Soap and Glycerine Producers was closed last month, winding up its affairs on February 15. Frank W. Luther, who had been in charge of this office since it was opened in the early days of the war, has transferred his headquarters to the main office of the association in New York.

## Detrex Appoints McCracken

Dr. W. L. McCracken has been appointed director of research and manager of alkali manufacturing by Detrex Corp., Detroit, according to a recent company announcement. He will have complete charge of chemical research and development engineering, as well as the chemical manufacturing operations carried on at the Detrex Hillview Plant. This covers activities in both industrial metal cleaning and drycleaning divisions of the company. Dr. McCracken will serve under C. F. Dinley, Sr., vice-president in charge of research and engineering. Prior to the war, Dr. McCracken had charge of research and development for the Detrex oil-extraction division. He received his Ph.D. at Iowa State.

## New Ga. Fill Regulation

New regulations covering the filling of packaged products have recently been announced by the Georgia Commissioner of Agriculture. The regulations deal particularly with the subject of underfilling of packages and their strict enforcement would, it is reported, present serious problems to packagers of household cleansers, soap flakes, insecticides, etc., which even under the best commercial packaging practice are likely to reach the consumer with more than the 10 per cent underfill fixed as the permissible maximum under the new regulations. It is reported that an informal conference may be held with the Georgia officials shortly in an attempt to iron out the problem.

T. B. STEDMAN

## Lever Names Stedman

T. B. Stedman has been appointed midwest regional sales manager of Lever Brothers, according to a report from the midwest regional sales office of the company in Chicago. Mr. Stedman started with Lever Brothers in 1925 and has held the positions of salesman, field supervisor, general field supervisor and divisional manager at Syracuse, Minneapolis and Detroit. In his new position, Mr. Stedman will have charge of Chicago, Detroit, Pittsburgh, and Minneapolis Divisions.

## Boston BIMS Winter Party

The annual winter party of the Buyers, Importers, Manufacturers and Salesmen organization of Boston was held at the University Club in that city on Friday evening March 7th. Members enjoyed swimming, cards, bowling and a number of prizes were offered. C. Ernest Ingham, Ingham & Co., Boston, BIMS chairman, reported that several new members were being signed up in the Boston chapter and plans are now underway for three outings during the coming summer.

## Potash Soap Assn. Moves

Potash Soap Association moved March 1 to permanent offices at 723 15th St., Washington, D. C. and vacated its temporary offices located at the Hotel St. George, Brooklyn. Andrew Federline, secretary of the Association is now making his headquarters at the Washington office and all mail should hereafter be directed to that address.

## Arkansas Soapers Honored

The Nu-Way Products Co., Little Rock, Ark., manufacturing a laundry bleach for distribution in nine mid-western states, and the Southern Chemical Co., of the same city, producers of a new boxed soap called "Hi-Sudz", were honored by the Greater Little Rock Chamber of Commerce late in February as "Manufacturers of the Week". Displays of their products were held in connection with the organization's weekly luncheon.

The Nu-Way Co. has been in the market about five years and is owned and operated by Wade Mallett and J. C. Sullivan. Southern Chemical Co. produces two types of laundry soap, a powder distributed in 100-pound bags to laundries and cleaning establishments, and the boxed product for retail sales, initial delivery of which was made last month. T. Hood is president, Oscar Hood, vice-president, and Wade Mallett is secretary of the Southern firm, which began operation in October, 1946.

## Offers New Detergent

Maid-Easy Cleansing Products Corp., Mount Vernon, N. Y, has reported that it will soon introduce a new packaged synthetic detergent under the name of "Maid-Easy" with advertising in newspapers, magazines, trade papers, and outdoor and transportation media.

# The winner

## by a nose!

**The contest between two cakes of soap on a counter may be equally close. But the one that gets her money, literally wins by a nose. If it smells best, it sells best—that's the true story of soap success . . . van Ameringen-Haebler, Inc., 315 4th Avenue, New York 10.**

*Your ideal can be achieved* **ask vA-H**

# Committee D-12 Meets

THE American Society for Testing Materials, D-12 committee on Soap Detergents, met in Philadelphia February 24th with B. S. Van Zile, Hercules Powder Company Experiment Station, Wilmington, chairman, conducting the session. Authorization was given for a joint AOCS and ASTM Committee for soap analysis. Mr. Van Zile pointed out that the new arrangement would make for better liaison between the two groups, and that only one meeting will now be necessary. Slight editorial differences were pointed out between the new AOCS methods and the methods of ASTM, in that ASTM has a separate set of methods for soaps containing synthetic detergents. The committee questioned the advisability of taking part in a program of setting up tests for trademarked ultimate consumer goods and referred the matter to a special committee for further study.

W. H. Koch, Mathieson Alkali Works, Niagara Falls, reporting for G. P. Fulton, chairman of the dry cleaning detergents sub-committee, reported a new classification of dry cleaning detergents based on low and high fatty acids content and on moisture content. Progress on methods for determining moisture was reported. The committee on specifications, F. W. Smithers, chairman, reported that revisions on all specifications have been reconsidered and that tentative changes are to be abolished, with reversion to specifications existing in 1941 and before. Reporting on special detergents, Mr. Koch, advised that new methods of analysis for sodium bicarbonate and sodium tetraborate are being provided.

The sub-committee on physical testing, headed by J. A. Woodhead, Colgate-Palmolive-Peet Company, Jersey City, reported that no completely satisfactory lather test had yet been decided upon. The committee further reported that no colorimetric pH test had been found reliable and that the use of the ASTM electrimetric, method is favored. Tests for wetting time, surface and interfacial tension, are still being worked upon. A further study on detergency is planned and a paper on detergency by O. C. Bacon, E. I. Dupont de Nemours & Co., will soon be published.

C. C. Zeigler, Swift and Co., Chicago, chairman of a special detergents sub-committee, reported that tentative specifications have been written for sodium borate and bicarbonate, and that producers' and consumers' suggestions are being studied. The specification for borax is set up only for the hydrate containing ten molecules of water of crystallization, both crystalline or powder. The specification for borax provides for a minimum percentage of 52.5 per cent on the basis of $Na_2B_4O_7.10H_2O$. The specification for sodium bicarbonate for use in preparations with or without soap calls for a white uniform powder and that any caking of the product must be readily breakable. The specification provides for a minimum of 99.6 per cent $NaHCO_3$, a maximum of 0.1 per cent matter insoluble in water, and 0.4 per cent $Na_2CO_3$.

J. C. Harris, Monsanto Chemical Co., St. Louis, chairman of the metal cleaners sub-committee, proposed that the method for testing corrosion of water-soluble aluminum cleaning materials be made tentative.

A number of changes in definitions were suggested by C. A. Marlies, chairman of the sub-committee on nomenclatures and definitions. The principal changes are in the method of listing chemicals and in the definitions of certain agents. A wetting agent is now defined as "a material which increases the spreading of a liquid on a surface." A foaming agent is "a material which increases the stability of a gas bubble suspension in a liquid medium." Washing is defined as "cleaning in an aqueous medium" as distinguished from dry cleaning which is defined as "cleaning in a non-aqueous medium." W. H. Koch, chairman of the papers and publications sub-committee, told of the help given by committee D-12 to Mr. Morse of the National Association of Purchasing Agents in the preparation of a booklet on cleaners. The date for the next meeting of Committee D-12 is still undecided. The Philadelphia meeting was the best attended since the Committee's inception in 1936.

## Colgate Licenses Process

A paper describing new modifications on the continuous hydrolysis method for converting fats into fatty acids and glycerine was read at the Louisville meeting of the American Institute of Chemical Engineers in mid-February. The paper, presented by H. D. Allen, W. A. Kline, E. A. Lawrence, C. J. Arrowsmith, and C. Marsel, all of Colgate-Palmolive-Peet Co., Jersey City, pointed out that the process was essentially that developed by Mills of Procter and Gamble and about the same time by Ittner of Colgate.

According to the authors, for producers splitting 3,000 pounds per hour or more of oil, the new process offers relatively cheap simple, continuous conversion of the fat to give a 97 per cent yield of fatty acids of good quality and an aqueous glycerine solution of 15 per cent concentration or better, which is readily concentrated and refined to chemically pure glycerine. A number of improvements have been made on the original process including one developed by Emery Industries, Cincinnati, whereby steam is injected directly into the hydrolizer itself through a heat-exchanging arrangement. Units of the process are now being installed at the plants of at least four soap manufacturers and numerous inquiries have reached Colgate from other soapers. The company states that they are issuing licenses for the use of the process. It will be described here in more detail in an early issue.

## New Miranol Plant Operates

The Chicago plant of the Miranol Chemical Co., Irvington, N. J., has started production of spray-dried synthetic organic detergents, according to a recent company announcement.

# MIRANOL
TRADEMARK

# SYNTHETIC ORGANIC DETERGENTS

Miranol Synthetic Organic Detergents are standardized to definite wetting out, detergent and foaming specifications. Immediate shipment can be made from distributor stocks in principal cities. Samples and prices on our new, improved 1947 production now ready. Write for them and a copy of our new booklet, A-11, which gives complete specifications on all products and their suggested applications.

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## FOR:

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In addition, we have products particularly adapted to making a wide variety of cosmetics. Our line also includes industrial detergents and wetting agents for use in the textile, paper, rubber, metal and other industries.

## Miranol Chemical Co., Inc.

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**PLANTS AT CHICAGO, ILLINOIS AND MILLTOWN, NEW JERSEY**

# Oppose Lower Soap Tariff

OPPOSITION to any further reduction in the tariff on soaps and glycerine in the present consideration of the extension of reciprocity trade agreements by Congress was filed last month in the form of a brief with the Committee on Reciprocity Information by Roscoe C. Edlund, manager of the Association of American Soap & Glycerine Producers. Because the manufacture of soap and glycerine and a strong soap industry are vital to the national welfare and defense, they should not be weakened by inviting imports, the AASGP brief maintains.

"The world economy of fats and oils," said the AASGP brief, "is only beginning to recover from the damage inflicted by World War II. Normal conditions will not return for a long while to come, and some countries are now shorter of fats and oils in relation to demand than they were at the height of the war. U. S. stocks are below any period for 20 years past, when our population was many millions smaller than it now is.

"There is nowhere any important surplus of soap for export. Under today's conditions, nations need for their own requirements all the soap they are able to produce; and except at the expense of their own people they have no soap which they can properly export. Nor are they likely to have any as long as present conditions continue.

"Soap has long been recognized as essential to public health and safety. The per capita consumption of soap is almost an index of civilization itself. If, then, supplies in civilized countries are short, is there sufficient reason for the United States to seek through reduction in duties to stimulate export to us of soaps really needed by the population of the countries which produce them?

"When fats are again in plentiful supply, the market for soap in the United States will doubtless be eyed hungrily by countries with access to cheap raw materials. If duties are low, soap imports might shoot up sharply. Japan's exports of cheap soap to the United States did this just prior to 1937. Argentina increased soap exports to us from one and a quarter million pounds in 1940 to seven and a half million pounds in 1941. Mexico in the first ten months of 1946 exported to us seven million pounds of soap compared with only four thousand pounds in the whole of 1944. These amounts while small are evidence that, if duties are made too low, the growth in imports could be very rapid. Yet when fats are available, U. S. manufacturers are amply able to produce all the soap the American consumer can use.

"The soapmakers of the United States have built a strong industry that has proved its value in two great wars and established itself as a recognized factor in national defense. We urge your Committee to accept our contention that this is not the time to weaken the home production of these essential commodities."

## Creme Shampoo Taxability

Considerable confusion regarding the taxability of so called "creme shampoos" under the cosmetic excise tax should be cleared by a report from the Toilet Goods Association, New York, which has inquired of the Commissioner of Internal Revenue how the rule applies to these products. Quoting from a letter of the Deputy Commissioner to TGA: "The Bureau holds that a shampoo containing more than 5 per cent saponaceous matter and which is advertised and sold solely for cleansing purposes is a soap or substitute for soap and as such is not taxable. A shampoo which is recommended on the label, or in other advertising matter, as a hair tonic or dressing, or for waving, bleaching, tinting, dyeing and otherwise changing the natural appearance of the hair, is subject to the tax imposed under section 2402 of the Internal Revenue Code, regardless of the amount of the saponaceous matter in the product. A shampoo which contains 5 per cent or less of saponaceous matter is taxable, regardless of advertising claims or other ingredients." The above rulings are applicable regardless of the physical appearance of the product, that is, whether the shampoo is in the form of an oil, liquid, or cream.

## Aromatics Tariff Cut Hit

Two men prominent in the essential oils industry recently urged that no reductions be made in present import duties on aromatic chemicals. Testifying before the Inter-Agency Committee for Reciprocity Information, Dr. Eric C. Kunz, president of Givaudan-Delawanna, Inc., New York, reminded the Committee that tariff rates on synthetic items had been cut in half in 1936. He also stated that, because of the high labor requirements in producing some 200 different chemicals of exceptional purity and high odor quality the American aromatic industry is vulnerable to competition from countries where workers earn only from one-fourth to one-tenth as much as do those in the United States. He stressed that the deterioration of the synthetic aromatic chemicals industry in U. S. would be a serious situation to face in time of war. Because of chaotic political and economic conditions abroad, Dr Kunz felt that it is not now the time to determine comparative costs and to re-adjust tariff rates.

A. L. Van Ameringen, president of Van Ameringen-Haebler, Inc., New York, warned the committee against jeopardizing American essential oil research. He pointed out that research must be supported from profits, and lower tariffs would cut profit margins. Essential oil growers from Michigan reported that peppermint oil from the Soviet Union is already underselling domestic oil in the United States.

## Frederick Zeisold Dies

Frederick H. Zieshold, 58, of Elizabeth, N. J., a specialist in perfume manufacture, died Feb. 8th, after a long illness. He had been associated with Van Ameringen-Haebler, Inc., New York perfuming materials, for twenty-five years. He was born in Leipzig, Germany, and resided in the United States for thirty years.

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| ½ OZ. SIZE | | 21½ | 25¼ | 25¼ | 24½ | 20½ | 13½ | 11¼ | 14½ | 8½ | 19¼ | 16¼ | 14¾ | 11 | 4½ | 24½ | 27½ | 21 | 12¾ | 17¾ | 27½ | | | | | |
| ¾ OZ. SIZE | | 20¾ | 20¼ | 25¾ | 19½ | 15¼ | 17 | 14½ | 9¾ | 9¾ | 14¾ | 16 | 12 | 13¼ | 8¼ | 15 | 26 | 18¾ | 12½ | 16 | 26½ | | | | | |
| 1 OZ. SIZE | | 19¾ | 22 | 27 | 22¼ | 16 | 16½ | 13½ | 9 | 10¾ | 13¾ | 15¾ | 9 | 13¼ | 10¼ | 17½ | 25¾ | 15¾ | 9¼ | 12¼ | 24½ | | | | | |
| 2 OZ. SIZE | | 13½ | 14¼ | 28 | 13½ | 6½ | 24¼ | 21¼ | 3¼ | 8¾ | 7½ | 16½ | 4¼ | 12 | 17 | 10 | 24¾ | 10 | 3¾ | 5¾ | 18 | | | | | |
| 2½ OZ. SIZE | | 9¾ | 10 | 29 | 9¾ | 3½ | 28 | 25¼ | -1¾ | 8 | 3¾ | 15¾ | ½ | 12 | 20 | 6 | 23¾ | 6¾ | ½ | 3½ | 14½ | | | | | |

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## Supervises Roycemore Sales

John J. McMichael was appointed eastern divisional sales supervisor for Ever-Dry Corp., Los Angeles, and Roycemore Toiletries, Inc., Chicago, according to an announcement by Roycemore on February 10th. Mr. McMichael has been associated with the toiletries business over a period of years in both the middle west and west coast areas, where for the past two years he has been assistant general manager of the Ever-Dry Corp. Among the products of the two companies are: "Every-Dry" liquid and cream deodorant, Roycemore gift toilet soaps, and "Trellis" soapless cream shampoo.

JOHN J. McMICHAEL

## Wyandotte Expansion

The difficulties encountered in expanding chemical processing facilities are well brought out in a folder entitled, "Report Concerning Alkali Expansion Program" issued recently by Wyandotte Chemicals Corp., Wyandotte, Mich. The company points out that although there is sufficient supply of raw materials to more than meet a planned $25,000,000 expansion program, the difficulties encountered in relieving the "bottlenecks" which must be overcome before increased quantities of soda ash and caustic can be produced are considerable.

After "tailor-made" conveying equipment is designed, it often takes 7 to 8 months to secure delivery. To add to the difficulties, the iron necessary for caustic pots and hundreds of other castings is still under government allocation. Progress on the Wyandotte expansion program has been considerable however. A new glycol plant is scheduled for spring of 1947. Pile driving for a new chlorine plant has been completed and foundations are under way. Construction is proceeding on schedule for the power plant addition, and one of the three new units for calcium carbonate production is in production; two more are scheduled for March 1. Steel is being erected for the synthetic detergent plant.

## Copra, Oil Import Rules

The basis on which permits will be issued for the importation of copra and coconut oil from the Philippines and Netherlands Indies during the first quarter of 1947 were announced February 6th by the U. S. Department of Agriculture. Importation into the United States is controlled by WFO-63 which requires copra and coconut oil importers to obtain permits from the Department of Agriculture. Under the Feb. 6th plan, crushers will be allowed to import no more than 10,000 tons of copra for domestic consumption. However, a crusher or coconut oil importer may arrange with the WFO-63 administrator for the further purchase abroad of oil or copra after he has shown that satisfactory arrangements have been made for the purchase of the commodities covered by the preceding license.

Trans-shipment of copra and coconut oil in bond through the United States to specified foreign countries will be granted if the applicant furnishes satisfactory evidence that the quantity is within the limits of IEFC allocations for the country of destination. Consideration will be given for hardship provisions of WFO-63.

## To Make Glycol Esters

Quaker Chemical Products Corp., Conshohocken, Pa., has begun manufacture of polyethylene glycol esters, particularly useful in the manufacture of perfumes, wax polishes, etc. By varying the chemical structure of the base materials used, esters having any desired degree of water or oil solubility may be obtained. Various members of the ester group are finding wide application as plasticisers, emulsifiers, dispersing and wetting agents.

## Scoville Appoints Root

LeRoy Root was recently appointed sales manager of the Drug and Cosmetic Container Division, Scoville Mfg. Co., Waterbury, Conn. Mr. Root spent twenty-five years at the company's New York office and will now make his headquarters in Waterbury. He is chairman of the convention committee of the Toilet Goods Association.

LeROY ROOT

## Set Rendering Trade Rules

A trade practice conference of the rendering industry was held at the Statler Hotel, St. Louis, February 28th, at which time members of the industry and of the Federal Trade Commission discussed fair trade practices. The Commission's staff is now busy preparing a set of rules to guide the industry in fair trade practice which should be of interest to all parties in the rendering industry.

## Hommel Represents Dreyer

O. Hommel Co., 209 Fourth Ave., Pittsburgh, recently became representatives for P. R. Dreyer Inc., New York importers and specialists in essential oils and aromatic chemicals. The Hommel Co. started representation in the Pittsburgh area in mid-February.

## American Can Sales Up

American Can Co., New York, had net sales of $258,065,461 in 1946, the highest for any year except 1941. Net income after taxes was $8,828,983, equal after preferred dividends to $3.40 a share on 2,473,998 common shares outstanding.

## Beauty Show in N. Y. Apr. 7

The 1947 International Beauty Show will be held in the Grand Central Palace, New York, April 7th through 10th, featuring a fashion show, a photo gallery, hair styling and cutting classes, and classes in make-up. Over 250 exhibitors are expected to exhibit equipment and products such as cosmetics, perfumes, dyes, etc.

## Remington to Berlin

Horace Remington, formerly vice-president of Colgate-Palmolive-Peet Co., prior to his retirement in 1943, has left for Berlin where he will direct export sales on the staff of Lt. General Lucius D. Clay. He will be responsible for negotiations of export sales of German products in foreign markets.

## Mich. ADCA Meetings Set

The first 1947 meeting of the Allied Drug and Cosmetic Association of Michigan was held at the Detroit Leland Hotel on January 14th at which time new officers were installed and a full program for the new year was announced. Meetings are scheduled as follows: Feb. 26th, Detroit, Leland Hotel; Mar. 26th, at the home of Donald Melville; April 22nd, May 27th, June 24th, August 26th, and Sept. 23rd, all at the Birmingham Country Club. The June 24th meeting will be a highlight of the schedule as at that time Detroit will be host to Chicago and St. Louis drug groups for a tri-city golf tournament.

## Continental Can Gets Mill

Continental Can Co., New York, acquired the net assets of Hummel-Ross Fibre Corp., Hopewell, Va., including its mill for the manufacture of Fourdrinier and cylinder kraft sulfate paper and liner board, according to a Continental announcement on Feb. 4th. The mill will be used to supply raw materials for fibre drum and barrel manufacture in the Van Wert, Ohio and Reading, Pa., plants of The Container Co., a subsidiary of Continental Can Co. The output of the newly acquired mill will gradually be taken over by Continental in the course of the next six to eight months, and will provide relief to the acute shortage of raw materials for drum production.

## Shiftan Van Ameringen V. P.

Ernest Shiftan was recently elected a vice-president of Van Ameringen-Haebler, Inc., manufacturer of

ERNEST SHIFTAN

aromatic chemicals, New York. He has been a perfumer for the company since 1939 and formerly was a perfume consultant in Paris.

## Printers' Hand Soap

A new hand soap, particularly for the graphic arts trade, was recently announced by Cromwell Paper Co., Chicago. It will be called "Cromwell Printers' Hand Soap." It is claimed that the soap will not harm the skin and is only slightly aklaline. The product is being distributed in 1½ lb. net weight can packages, 24 cans to the case.

## Soap Output Gains

Citing a gain in soap production for the first time in two years, the Association of American Soap and Glycerine Producers, New York, announced early in February that pounds of soap delivered during the 4th quarter of 1946 were still substantially below the pre-war average of years 1935 through 1939. Fourth-quarter deliveries of soap other than liquid by seventy soapers totaled 603,000,000 pounds and, while this was an increase of 22 per cent over the 494,000,000 pounds delivered in the third quarter of 1946, sales that quarter had been the lowest in nearly ten years. During the entire year 1946, these manufacturers delivered 2,315,000,000 pounds of soap other than liquid. This was 19 per cent less than the deliveries for 1945, and 29.4 per cent less than deliveries in 1944. Per capita, the soap delivered in the United States last year was 11.6 per cent less than the average of 1935 through 1939. Deliveries of liquid soap totalled 864,000 gallons in the fourth quarter of 1946 compared with 780,000 gallons in the third quarter, an increase of 10.8 per cent. The total for the year was 3,263,000 gallons, which was 2.5 per cent above 1945 and 10 per cent above 1944.

## CDCA Hears Bradley

The Chicago Drug and Chemical Association held its monthly luncheon meeting February 27th at the Drake Hotel. Preston Bradley, pastor of the Peoples' Church for 35 years and well known humanitarian was the guest speaker.

**The new Crosby Chemicals, Inc. naval stores plant at De-Ridder, Louisiana, makes its first shipment of rosin and turpentine. As the photo taken on the dock at the Port of Lake Charles, Louisiana, shows, the shipment was a large one. Operations at the plant were begun in November, 1946.**

Martin J. Peters, for the past 25 years connected with the soap dispenser sales and production departments of Moore Brothers Co., New York, was elected vice-president of the company at the board of directors' meeting Feb. 8. He is a regional vice-president of the National Sanitary Supply Association.

### Ask End Of IEFC Controls

Both members of industry and of the U. S. Department of Agriculture took a stand, in mid-February, against further U. S. participation in the international system of allocating world supplies of fats and oils. Stating before a house food investigating committee that the allocation system had worked to the disadvantage of American consumers, John B. Gordon, Bureau of Raw Materials, American Vegetable Oils and Fats Industries, pointed out that American consumers have to pay prices for fats and oils far in excess of those required to stimulate production, while other nations, having exclusive rights to some supply sources are paying prices so low as to hold production down to subnormal levels.

Members of the Department of Agriculture pointed out that because of the severe pinch in supplies the department thus far has refused to make any export commitments during the second and third quarters to the International Emergency Food Council. Omer Herrmann, director of fats and oils branch of the Production and Marketing Administration, USDA, testified that the department contemplates the exportation of only 463,000,000 pounds of fats and oils in 1947. It also proposes that importations shall reach 898,000,000 pounds. The IEFC program, however, calls for exports of 628,000,000 pounds from the U. S., and imports of only 806,000,000 pounds. Domestic production of fats and oils for 1947 is estimated at 8,725,000,000 pounds. Mr. Herrmann said that the Secretary of Agriculture feels that other countries are not doing all they should to stimulate production of fats and oils.

### Honor Ralston of Armour

Anderson W. Ralston, Armour Research Laboratories, Chicago, was recently named winner of the 1947 "Midwest Award" of the St. Louis section of the American Chemical Society. The award is made annually in recognition of "meritorious contribution to the advancement of pure or applied chemistry or chemical education" to scientists working in the midwest, and was formally presented to Dr. Ralston at a meeting of the group in St. Louis, March 10th. A large number of new chemicals resulted from Dr. Ralston's work on fatty acids and fats.

### Canada Soap Price Control

Controls covering soap prices in Canada have been revised within recent weeks by the Dominion Wartime Prices and Trade Board through the issuance of two new orders, No. A-2258, issued January 29th, and No. A-2275, issued February 13th. When soap prices were originally fixed in Canada the basic period taken was the level of September 1941. This basic period was subsequently changed to June 1941, which had the effect of rolling back prices approximately 9%. The issuance of Order No. A-2258 now allows manufacturers to charge the June 1941 price level, plus an upcharge of 9%, thus having the effect of restoring the September 1941 level.

Order No. A-2275 controls maximum prices on sales by jobbers, wholesalers and retailers. In general it provides that the maximum for such sales shall not exceed the sum of the following: actual cost price (not exceeding legal ceiling) plus actual transportation charges, plus the highest markup to which the seller was entitled as of January 31, 1947.

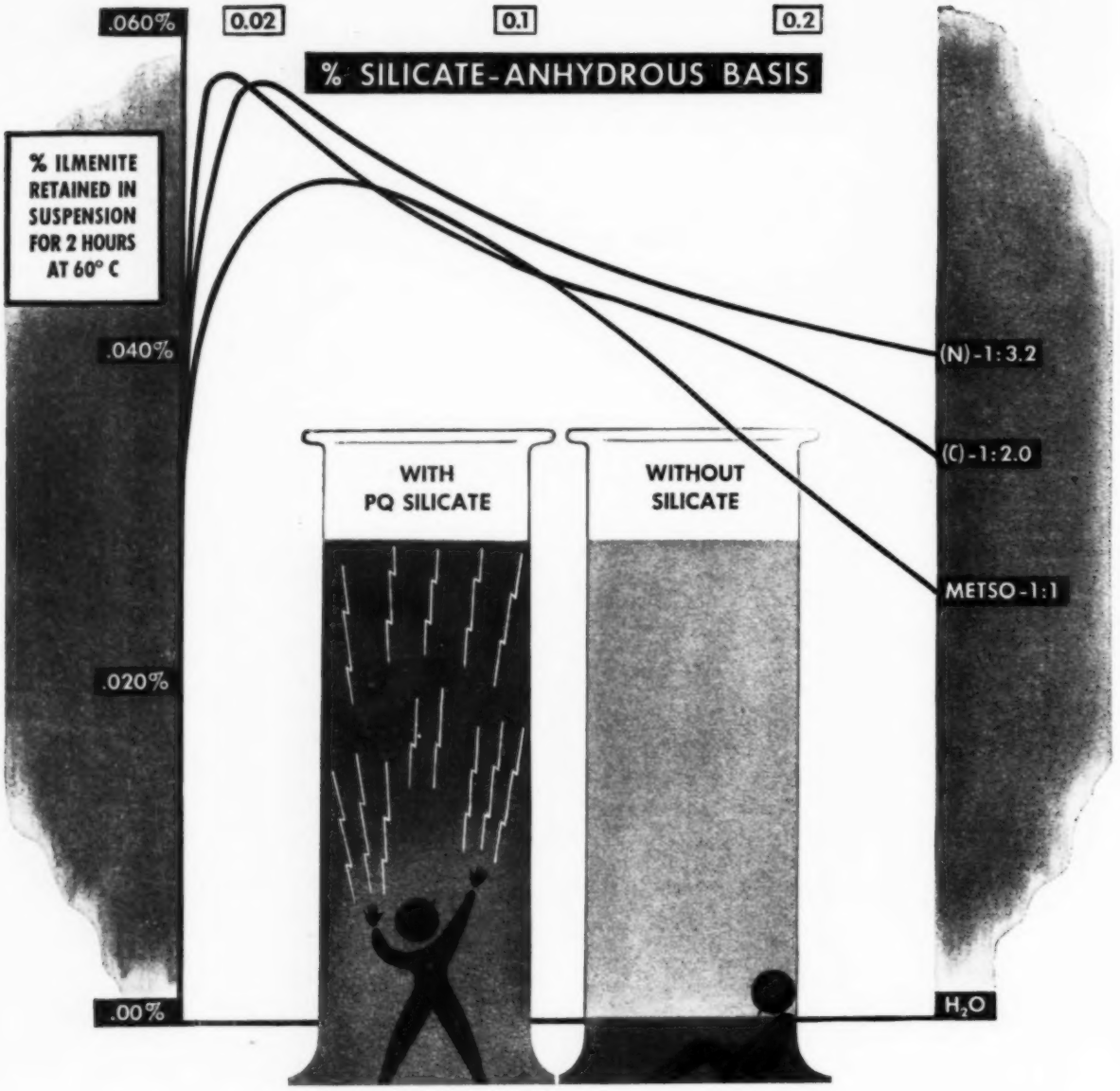
## Kamen Conversion Completed

KAMEN SOAP PRODUCTS CO., New York, reports that conversion of the company from its status as wartime supplier of soap, started in 1940 for supplying the needs of the military, to full fledged peacetime operation is now about complete.

Because of wartime shortages in equipment and skilled mechanics, Kamen Soap Products Co., founded by A. L. Kamen, Rae Kamen, and Max N. Kamen, was compelled to begin production in 1940 with comparatively inefficient methods. However, it was not long before the company was able to enlarge its capacity and to secure modern equipment. During the war, the company earned the praise of the Navy Department for its part in the formulation and production of a salt water soap. From 1943 to 1945, most of the company's production was used by the Navy.

With the war's end, the company was faced with the problem of conversion to a peacetime operation. The change was considerably facilitated when C. B. Johnson, now vice-president of the company, assumed complete charge of production and plant operation, at Barberton, Ohio. The company is now increasing its output of laundry and household soap and is planning an extensive marketing campaign for the Akron area which is to receive the greater portion of the output of "Kamenol," a soap in flake and bead form, and "Kamen Kleen," a laundry bar. The campaign will be aided by extensive advertising via radio, newspapers, car cards, direct mail and trade papers in the Akron area.

Among the products produced by Kamen are soap beads (60 per cent anhydrous), laundry soap bars (brown), soap powders, flakes, scouring powders, dish washing compound fatty acids, glycerine, and recently a synthetic detergent being marketed as "Kamco."




## PQ SILICATES AT WORK ON DIRT

Good detergent action involves keeping solid dirt in the state of suspension until it can be freely rinsed away. In distilled water, soap is a satisfactory suspending agent, but in commercial waters soap and silicate are better over a wide range of concentration. Furthermore, the soluble silica ($SiO_2$) has the added advantage of preventing the redeposition of the removed dirt onto the cleaned object.

PQ Silicates long have been used as economical dirt suspenders. The behavior of three widely-accepted detergent PQ Silicates in suspending dirt is charted above. The soil used was Ilmenite black; the time 2 hours, the temperature 60° C. Note that all silicates work efficiently over laundry concentrations.

May we tell you about this and other valuable detergent properties contributed by PQ Silicates to cleaning compounds and soaps? Send for our Bulletin No. 170 "The Role of Silica."

SILICATES PQ OF SODA

**PHILADELPHIA QUARTZ CO.**

**DEPT. B, 129 SOUTH THIRD STREET, PHILADELPHIA 6, PA.**

## Dexter Adds "Strodex D"

The Textile Chemical Division of Dexter Chemical Corp., New York, recently announced the addition of "Strodex D" to their line of textile chemicals. "Strodex D" is a cream-colored pasty detergent, readily soluble in water at 120 to 125 degrees, and is recommended for scouring, emulsifying, dye-dispersing, and wetting-out. Its resistance to hard water, acids, alkalies and salts is said to be high and it is easily rinsible. It does not form scum with hard water and even weak solutions are said to show a good quality lather. According to a statement from Dexter laboratory, concentrations of acids or alkalies normally used in textile processing do not affect the action of "Strodex D" and it is stable enough to be used in solutions of oxidizing agents.

## Issue Monopoly Report

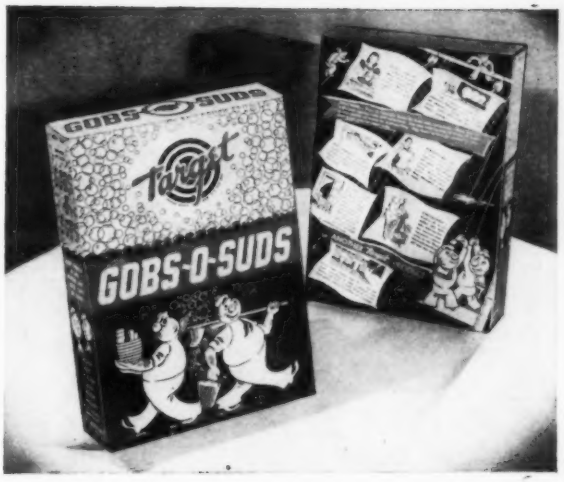
The Small Business Committee of the House of Representatives which has been investigating the existence of monopolistic practices in American industry, recently issued a report on its activities. The soap industry is referred to only briefly, the committee confining itself largely to quoting several statements about the industry which have appeared in various periodicals.

## Dana Starts New York Salon

Consolidated Cosmetics and Dana Perfumes, Chicago, manufacturers of "Tabu," "20 Carats" and "Platine Perfumes," announced the new location of their retail salon and regional offices at the Savoy Plaza Hotel, New York. It is expected that the new quarters will be occupied in the late Spring of 1947.

## Form Sharples Continental

The formation of a new company, the Sharples Continental Corp., formed and owned by Sharples Chemicals, Inc., Philadelphia, and Continental Oil Co., New York, was recently announced by the companies. The new organization will produce synthetic organic chemicals from petroleum raw materials. The first production unit, at Baltimore, will make nonyl-naphthalene, an alkylated aryl hydrocarbon, which serves as an intermediate for production of a wetting, washing and emulsifying agent of the alkyl-aryl sulfonate type. It will be marketed under the name, "Neolene."




"Gobs-O-Suds," produced by Chemical Manufacturing and Distributing Co., Easton, Pa., is a new sodium alkyl-aryl sulfonate type detergent, recommended for use in hard, soft, hot, cold water for lingerie, woolens, glassware, and dishes.

## New Remus Agent Apptd.

The appointment of Associated Chemicals, manufacturing agents, of Omaha, Nebr., as representatives for Edward Remus & Co., New York importers and exporters of essential oils and aromatic products, is announced. They will represent the Remus line of materials for the confectionary, perfume, soap, drug and chemical trades in the states of North Dakota, South Dakota and Minnesota.

## Florasynth in New Office

The establishment of new and larger offices on the west coast was announced in mid-February by Florasynth Laboratories, New York. The new offices, located at 732 Montgomery St., San Francisco, 11, will be headed by Walter J. Moreland who has been in charge of the west coast branch in the past.

## Paint Brush Cleaner

A paint brush cleaner is sold under the name of Devoe brush shampoo by Devoe & Reynolds Co., New York. The liquid is diluted with one part of water and is claimed to be efficient for cleaning hardened paint, lacquer, varnish, shellac, or enamel.

## Chem. Mfg. Distributor

Lehigh Valley Chemical Company, Allentown, Pa., has been appointed a distributor for the Chemical Manufacturing & Distributing Company, Easton, Pa. The Lehigh Valley Chemical Company will be engaged in the business of distributing industrial and fine chemicals in the Lehigh Valley and neighboring territory, leaving the Chemical Manufacturing & Distributing Company free to confine its efforts 100 per cent to manufacturing soap and related products, including its new product, "Gobs-O-Suds," and other household sanitation products. The officers of the Lehigh Valley Chemical Company are: Carl E. Schaad, President; Esther Schaad, Vice-President, and Emilie Schaad, Secretary and Treasurer.

## Curzon, Harris Soap, Dies

John Richard Curzon, 55, vice-president and general manager of Harris Soap Division of Hygrade Food Products Corp., Buffalo, was stricken with a heart attack in his office recently and died soon after. A research chemist, Mr. Curzon came to the United States from England and had been with Harris for 20 years.

## TGA Washington Counsel

The firm of Hamel, Park & Saunders was recently retained by the Toilet Goods Association, New York, as its counsel in Washington, D. C. Mock & Blum, New York, continues as general counsel for the association.

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Write us on your firm's letterhead for suggestions and samples.

# Schimmel & Co., Inc.

**601 West 26th Street, New York 1, N. Y.**

# NEW TRADE MARKS

The following trade-marks were published in the February issues of the *Official Gazette* of the United States Patent Office in compliance with Section 6 of the Act of September 20, 1905, as amended March 2, 1907. Notice of opposition must be filed within thirty days of publication. As provided by Section 14, fee of ten dollars must accompany each notice of opposition.

## Trade Mark Applications

QUICKEE—This in upper case, bold, reverse letters for hand cleaner. Filed Feb. 7, 1946 by Tudor Chemical Specialties, Inc., New York. Claims use since Oct. 2, 1944.

ATOMAGIC—This in upper case, extra bold letters for white metal cleaner. Filed Feb. 15, 1946 by Romar Chemical Co., Philadelphia. Claims use since Nov. 1, 1944.

WHIRL FOAM—This in upper and lower case, bold script letters for the word "Whirl" and upper case, extra bold letters for the word "Foam" for upholstery and rug cleaner in liquid form. Filed Mar. 27, 1946 by Whirlfoam Upholstery and Rug Cleaner Co., Detroit. Claims use since Nov. 1, 1945.

HUMDINGER—This in upper case, bold letters for needle polisher. Filed Mar. 30, 1946 by H. C. Harding, Inc., Philadelphia. Claim use since May, 1932.

ATOMIC—This in upper case, reverse letters on a "splash" type background for cleaning liquid. Filed Oct. 6, 1945 by Harry Gelke, Cincinnati. Claims use since Sept. 19, 1945.

BIONOL—This in upper case, bold letters for antiseptics and disinfectants. Filed Apr. 29, 1946 by General Dyestuff Corp., New York. Claims use since Apr. 11, 1946.

BBC—This in upper case, extra bold, black letters for bowling ball cleaner. Filed Apr. 3, 1946 by Brunswick-Balke-Collender Co., Chicago. Claims use since Oct. 4, 1945.

WOODEE—This in upper case, extra bold letters for floor cleaner. Filed Apr. 25, 1946 by Windsor Wax Co., Hoboken, N. J. Claims use since Sept. 5, 1942.

YOUNG LAD—This in upper and lower case, extra bold, black script letters for pine soap. Filed May 1, 1946 by Helene Pressl, Inc., New York. Claims use since Dec. 12, 1945.

TREND—This in upper case, extra bold, oversize letters for household cleanser. Filed Oct. 31, 1946 by Purex Corp., South Gate, Calif. Claims use since Oct. 18, 1946.

CAL-C-NATE—This in upper case, extra bold, black letters for insecticides. Filed Oct. 29, 1945 by Parsons Chemical Works, Grand Ledge, Mich. Claims use since Feb. 1, 1945.

CERBALATE—This in upper case, bold letters for germicides and bactericides. Filed Mar. 21, 1946 by Westbury Chemical Co., New York. Claims use since July 5, 1945.

MOUSE NOX—This in upper case, extra bold, black letters for rodenticides. Filed Apr. 15, 1946 by Stanley Industries, Seattle, Wash. Claims use since Jan. 2, 1940.

TRE-TEX—This in large and small capitals for animal and insect repellent. Filed May 8, 1946 by E. L. Eckerley, Hamilton, Ind. Claims use since Apr. 23, 1946.

HI DAD!—This in upper case, bold letters for soap. Filed Dec. 27, 1945 by Monogram Soap Co., Hollywood, Calif. Claims use since Jan. 1, 1942.

HI MOM—This in upper and lower case, medium script letters for soap. Filed Dec. 27, 1945 by Monogram Soap Co., Hollywood, Calif. Claims use since Jan. 1, 1942.

FOUNTAIN OF YOUTH—This in upper case, medium letters for soaps and soap powders. Filed Jan. 11, 1946 by George Edward Sachs, New York. Claims use since Dec. 14, 1942.

MANNECLEAN—This in upper case, extra bold, black letters for cleaning preparation. Filed Jan. 23, 1946 by William H. Thomson, Baltimore. Claims use since Mar. 15, 1943.

COR-RE-LAB—This in upper case, bold, italic letters for rust preventive. Filed Aug. 25, 1944 by June and Co., Detroit. Claims use since July 14, 1944.

SOLTROL—This in upper case, bold letters for insecticide base oils. Filed Feb. 28, 1946 by Phillips Petroleum So., Bartlesville, Okla. Claims use since Feb. 9, 1946.

ET CETERA—This in lower case, medium and bold script letters for shampoo. Filed Mar. 18, 1946 by Alfred D. McKelvy, New York. Claims use since Mar. 10, 1946.

FREOSOL—This in upper case, bold letters for germicide. Filed Mar. 27, 1946 by Denmore Products Corp., New York. Claims use since Mar. 25, 1946.

BUGRENADE—This in large and small, bold, capitals across the top side of the wing of a fanciful bug for insecticide. Filed Mar. 29, 1946 by Enterprise Industries, New York. Claims use since Mar. 18, 1946.

CRESATIN—This in upper case, bold letters for antiseptic. Filed Apr. 12, 1946 by Sharp & Dohme, Inc., Philadelphia. Claims use since Dec. 9, 1909.

SIXIDE—This in large and small, bold, capital letters within an "H" shaped design in the upper portion of which are the symbols, "$C_6H_6Cl_6$" and in the lower portion are the initials, "C.S.C." for insecticidal preparations. Filed Apr. 13, 1946 by Commercial Solvents Corp., New York. Claims use since Apr. 9, 1946.

THANASOL—This in upper case, bold letters for active ingredient in insecticides. Filed Apr. 16, 1946 by Hercules Powder Co., Wilmington, Del. Claims use since Apr. 5, 1946.

HY-FO—This in upper case, extra bold, oversize letters for bactericide. Filed Apr. 18, 1946 by Edw. Livingston & Sons, Kansas City, Mo. Claims use since Feb. 1, 1946.

OKEMCO—This in upper case, extra bold letters for all purpose cleaning compounds. Filed May 10, 1946 by Oakite Products, Inc., New York. Claims use since Feb., 1914.

EVICTOR—This in upper case, bold letter in the form of an arc for insecticide. Filed May 21, 1946 by O'Sullivan, Inc., Baltimore. Claims use since Dec. 14, 1945.

# ESSENTIAL OILS
## for use in
## SOAPS.....

WITH ESSENTIAL OILS now in easier supply, soapmakers can choose their raw materials more with the thought of QUALITY in mind than of AVAILABILITY. Which prompts us to offer:

## OIL CITRONELLA....

A JAVA TYPE OIL of exceptional quality and favorably priced. This oil, which is produced principally in Central America, is identical with the pre-war oils imported from Java and is, in fact, far superior to the meagre lots of Java Oil reaching this country in recent months. Soapmakers who care to examine samples of this oil will find it a product of unusual quality and economy.

## OIL LEMONGRASS...

THIS OIL, too, is of a quality not freely available since the recent war. We shall be glad to supply samples and quote interested buyers upon request.

## BASICOLS*.....

SOAPMAKERS can extend their present supplies of essential oils by using these supplemental materials. BASICOLS lend a more natural note to the finished product than do the straight imitation oils. They make for economy when used as substitutes or stretchers for the costlier natural oils, and their powerful fixation greatly improves the lasting character of a product's fragrance. For proof of their effectiveness, write us for test samples and quotations. Types available: Geranium, Lavender, Lemon, Neroli, Orris, Pine and Ylang Ylang.

*Exclusive trade mark registered U. S. Patent Office.

**FRITZSCHE** *Brothers, Inc.*

PORT AUTHORITY BUILDING, 76 NINTH AVENUE, NEW YORK 11, N. Y.

BRANCH OFFICES and STOCKS: *Boston, Mass., Chicago, Ill., Los Angeles, Calif., St. Louis, Mo., Toronto, Canada and Mexico, D. F.* FACTORIES: *Clifton, N. J. and Seillans (Var), France.*

GENIDUST—This in upper case, extra bold letters for parasiticides. Filed May 31, 1946 by General Chemical Co., New York. Claims use since May 1, 1946.

PENSALCO—This in lower case, inline letters for insecticides. Filed May 31, 1946 by Pennsylvania Salt Manufacturing Co., Philadelphia. Claims use since Mar. 25, 1946.

SIOLITE—This in upper and lower case, extra bold, black letters for insecticide. Filed Nov. 4, 1945 by Mallinckrodt Chemical Works, St. Louis. Claims use since Aug. 7, 1946.

MEDOSOL—This in upper case, bold stencil letters for insecticide. Filed Nov. 4, 1946 by Shell Oil Co., San Francisco. Claims use since Sept. 9, 1946.

GAY-BRITE—This in lower case, and upper case, extra bold, black letters for shoe and boot polish. Filed Feb. 4, 1946 by General Shoe Corp., Nashville, Tenn. Claims use since Jan. 14, 1946.

SUNBASK—This in upper case, bold letters for hand and bath soap. Filed May 10, 1946 by Antoine de Paris, Inc., New York. Claims use since Apr. 11, 1946.

XANDRA—This in upper and lower case, medium letters within a wreath for soap. Filed May 10, 1946 by Maurella Products Co., New York. Claims use since Jan. 1, 1937.

OKEMCO—This in upper case, bold letters for industrial cleaning preparations. Filed May 10, 1946 by Oakite Products, Inc., New York. Claims use since Feb. 1914.

CALGLO—This in upper case, extra bold letters for detergent. Filed May 11, 1946 by Calgon, Inc., Pittsburgh, Pa. Claims use since Jan. 3, 1945.

MING YU—This in upper case, extra bold, black letters for shampoos. Filed Oct. 4, 1945 by Associated Products, Inc., Chicago. Claims use since Aug. 15, 1945.

MAKE-UP TIME—This in upper case, medium letters for bubble bath. Filed Mar. 22, 1946 by Kinghill Laboratories, New York. Claims use since Feb. 26, 1946.

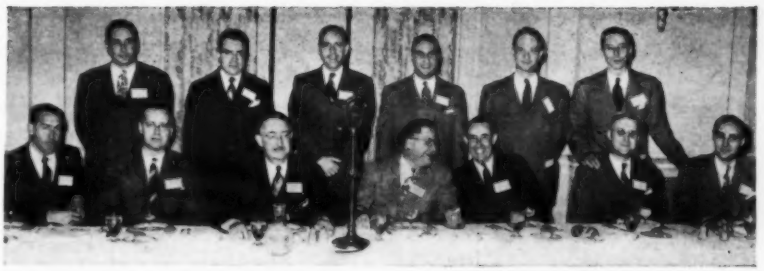
PHENOL SODIQUE—This in upper case, bold, outline letters for antiseptic and disinfectant. Filed Apr. 9, 1946 by Hance Bros. & White Co., Philadelphia. Claims use since Sept. 4, 1863.

SYNDEET—This in upper case, bold letters for insecticides. Filed Apr. 24, 1946 by United States Rubber Co., New York. Claims use since Mar. 7, 1946.

DIFUSO—This in upper case, open letters within an oval border design for insecticides. Filed May 13, 1946 by Tanglefoot Co., Grand Rapids, Mich. Claims use since Feb. 20, 1946.

SWEL—This in upper case, bold letters for shampoo. Filed May 27, 1946 by La Mour Products, Inc., Minneapolis. Claims use since Feb. 28, 1944.

MURAC—This in upper case, extra bold, extra large letters for metal descaling preparation. Filed June 29, 1946 by Cowles Detergent Co., Cleveland. Claims use since May 29, 1946.



**Wyandotte Salesmen Confer**

**The district sales managers of the Michigan Alkali Division, Wyandotte Chemicals Corp., Wyandotte, Mich., were guests of the research staff at a recent seminar meeting. Two such meetings were held in 1946 and one so far this year with the view toward bringing together management, sales and professional employees on a common meeting ground. The gatherings have featured talks by Bert Cremers, vice-president in charge of sales; Mel Clark, manager of soda ash, caustic and bicarbonate sales; and W. F. Torrey, vice-president of the corporation.**

**Highlighting the technical sessions were accounts of Wyandotte synthetic detergent and glycol processes by F. W. Smith and J. R. Heard, respectively, section heads in chemical engineering. Further technical information was given by J. J. Schaefer, director of development, and Dr. T. H. Vaughn, director of research.**

**In the picture, standing from left to right are: S. B. Scott, assistant eastern director of sales: M. Thompson, Chicago; M. Conway, Pittsburgh; H. Brunner, Detroit; R. Moister, Atlanta; and E. Heiser, Cincinnati. Bert Cremers is seated at extreme left next to Dr. Vaughn.**

## Trade Marks Granted

425,197. Bubble bath preparation. Filed by Stephen Riley Co., Los Angeles, Mar. 18, 1946. Serial No. 498,460. Published Aug. 13, 1946. Class 6.

425,234. Shaving cream. Filed by MacGregor Men's Toiletries, Inc., New York, Mar. 29, 1945. Serial No. 481,485. Published Aug. 27, 1946. Class 4.

425,235. Soap and mechanics' cleanser. Filed by Davis Soap Co., San Francisco, Apr. 16, 1945. Serial No. 482,194. Published Aug. 13, 1945. Class 4.

425,241. Polishing and cleaning preparation for furniture, pianos, and the like, paint and varnish remover and scratch remover. Filed by National Polish Co., Van Wert, O., July 16, 1945. Serial No. 485,881. Published Aug. 13, 1946. Class 16.

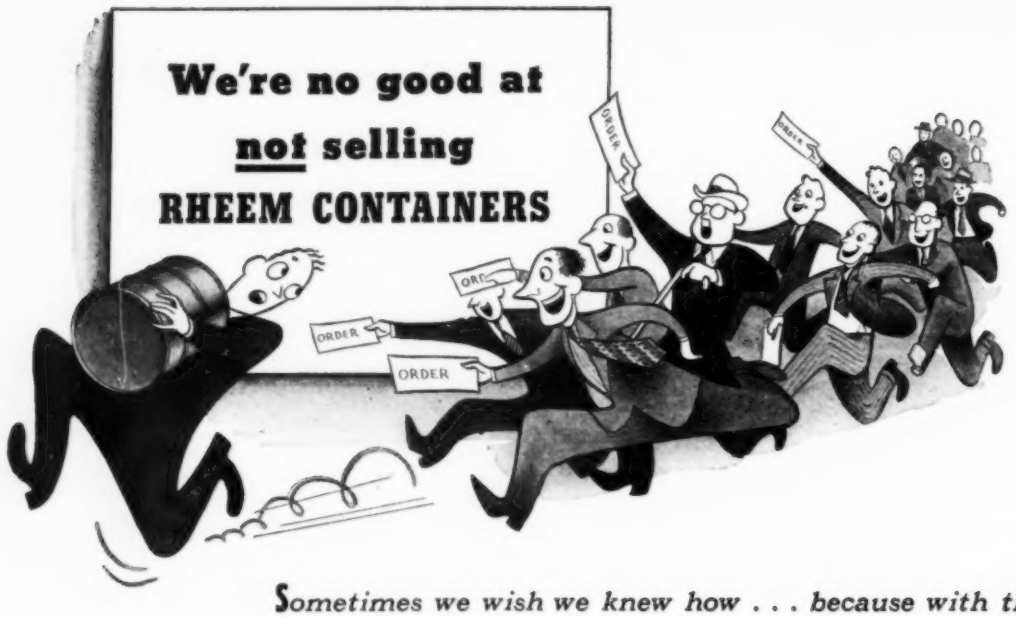
425,246. Self-polishing waxes, floor, furniture and automobile polishing waxes and furniture polishes. Filed by Chemical Manufacturing & Distributing Co., Easton, Pa., Aug. 21, 1945. Serial No. 487,354. Published Aug. 6, 1946. Class 16.

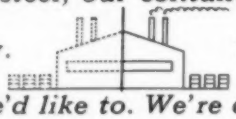
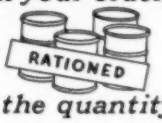
425,248. Detergent preparations for use in bathing. Filed by Stephen Riley Co., Los Angeles, Aug. 24, 1945. Serial No. 487,526. Published Aug. 6, 1946. Class 4.

425,250. Dry cleaning preparation. Filed by La France Dry Cleanings, Inc., Youngstown, O., Aug. 28, 1945. Serial No. 487,681. Published Aug. 13, 1946. Class 4.

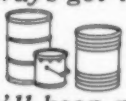
425,259. Wax for linoleum, wood floors, rubber tile, composition, cement, terrazo, marble, varnished, shellacked and painted floors and kindred uses. Filed by Speigel, Inc., Chicago, Oct. 24, 1945. Serial No. 490,-

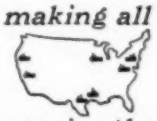
(*Turn to Page* 147)

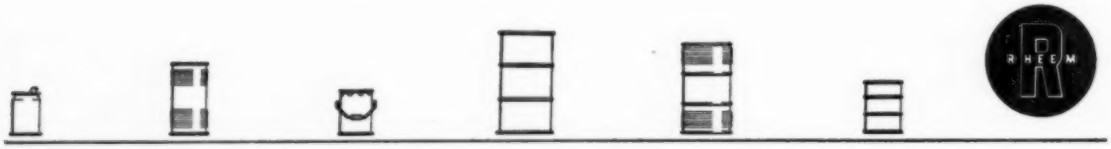



*Sometimes we wish we knew how . . . because with the shortage of steel, our container plants are able to turn out only half of their full capacity.*  *This makes it impossible for us to fill your orders as fast as we'd like to. We're doing our best, though, to stretch* 

*the limited production of Rheem containers to give each of you the quantity you need.*

*But whether you get 200 or 200,000, with Rheem you'll always get the quality you need. For Rheem steel containers are "tailor made"*  *to fit your product's specifications. As long as there's any steel, we'll keep making them that way.*

*And there's a better day coming . . .* *wait and see. When it gets here, Rheem will again be making all the containers you can use. With seven plants from coast to coast,*  *you'll be sure of getting the kind of quick, on-the-spot container service that has made Rheem famous for over twenty years. Rheem, 570 Lexington Avenue, New York 22, N. Y.*

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# BIDS AND AWARDS

### P. O. Paste Soap Bids

In a recent opening for miscellaneous supplies by the Post Office Department, Washington, D. C., the following bids were received on 50 kegs of 100 pounds each of paste soap and 60 barrels of 450 pounds of paste soap: Cole Laboratories, Long Island City, N. Y., item 2, 15.8 cents a pound; E. F. Drew & Co., New York, item 1, 15 cents and item 2, 14 cents; Mathers-Lamm Paper Co., Washington, D. C., item 1, 18 cents and item 2, 17 cents; R. M. Hollingshead Corp., Camden, N. J., item 1, 18 cents and item 2, 16 cents; Knoxall Corp., Indianapolis, item 1, 19 cents and item 2, 18 cents; John T. Stanley Co., New York, item 2, 9.33 cents; Peck's Product's Co., St. Louis, item 1, 11.75 cents and item 2, 11.25 cents; Fisher Industries, Cincinnati, item 1, 13.9 cents and item 2, 13.7 cents; Harley Soap Co., Philadelphia, item 1, 11.7 cents and item 2, 10.7 cents; Clifton Chemical Co., New York, item 1, 16.5 cents and item 2, 15 cents and Crystal Soap and Chemical Co., Philadelphia, item 1, 18 cents and item 2, 15 cents.

### Toilet Soap Bids

Bids on 1,200 gallons of toilet soap in a recent opening for miscellaneous supplies by the Post Office Department, Washington, D. C., were received from: Standard Soap Co., Camden, N. J., 95 cents a gallon; Burnhardt Brothers, Brooklyn, 62 cents; Mathers-Lamm Paper Co., Washington, D. C., 80 cents; Unity Sanitary Supply Co., New York, $1.14; Cole Laboratories, Long Island City, 79 cents; Knoxall Corp., Indianapolis, 75 cents; Penetone Co., Tenafly, N. J., 50 cents; R. M. Hollingshead Corp., Camden, N. J., 68 cents; Trio Chemical Works, 57 cents, f.o.b. Brooklyn, 62 cents f.o.b. Washington; Fisher Industry Sales, Cincinnati, $1.01; Tesco Chemicals, Atlanta, $1.37; Pioneer Flintkote Co., Los Angeles, 50 cents; National Cleanser Products, New York, 97.5 cents, 90 cents in 55 gallon drums; Dixie Janitor Supply Co., Washington, D. C., 80 cents; Peck's Products Co., St. Louis, 53 cents; M & M Chemical Co., Houston, Tex., 70 cents; Herbert Sommers, Washington, 75 cents, f.o.b. Baltimore, 79 cents, f.o.b. Washington; Crystal Soap & Chemical Co., Philadelphia, 70 cents; Lanair Chemical Corp., Chicago, 53 cents, and Pacific Chemical Co., Los Angeles, 65 cents.

### Misc. Navy Soap Bids

The following bids were received in a recent opening for miscellaneous supplies by the New York Navy Purchasing Office, New York: (2) 3,200 pounds of linseed oil soap; (3) 1,100 pounds of toilet soap; (5) 35,100 pounds of powdered hand soap; (6) 28,000 pounds of toilet soap and (7) 6,920 pounds of laundry soap; Unity Sanitary Supply Co., New York, item 2, 25 cents a pound, item 3, 40 cents, item 5, 38 cents, item 6, 25 cents and item 7, 33 cents; Octagon Process, Brooklyn, item 7, 8 cents; Cole Laboratories, Long Island City, N. Y., item 2, 18 cents and item 3, 21 cents; Clifton Chemical Co., New York, item 2, 19.5 cents and item 3, 28 cents; Harley Soap Co., Philadelphia, item 2, 19 cents and item 3, 23 cents; Crystal Soap & Chemical Co., Philadelphia, item 2, 30 cents; Turco Products, Los Angeles, item 6, 12 cents; Pacific Chemical Co., Los Angeles, item 2, 27 cents; North Coast Chemical & Soap Works, Seattle, item 2, 23.5 cents for 900 pounds for Seattle Depot only.

### Sweeping Compound Bids

The following bids were received in a recent opening by the Department of Justice, Washington, D. C., on an unspecified quantity of sweeping compound: Crystal Soap & Chemical Co., Philadelphia, 80 cents; Factory & Yard Supply Co., New York, 87 cents; Joseph E. Frankle Co., Philadelphia, $1.05; R. M. Hollingshead Corp., Camden, N. J., 83 cents; Lowe & Feldkireher, Nashville, Tenn., 2.5 cents and 95 cents; Reliance Chemical Co., St. Louis, 66 cents; McCann Chemical Co., Louisville, $1; Sterling Supply Corp., Philadelphia, $1.36.

### USDA DDT Bids

In a recent opening of the Department of Agriculture, Division of Purchases Sales and Traffic, Washington, D. C., the following bids were received on 18,000 pounds of DDT: Pennsylvania Salt Manufacturing Co., Philadelphia $42 cwt and E. I. du Pont de Nemours & Co., Wilmington, $38.25.

### P. O. Hand Soap Bid

Unity Sanitary Supply Co., Washington, D. C., was the only bidder on 20,000 cakes of grit hand soap in a recent opening for miscellaneous supplies by the Post Office Department, Washington, D. C.

### DCAT Fall Meeting Sept. 25

Resumption of the fall meeting and golf tournament this year, after a lapse of 5 years, was announced by the Drug, Chemical and Allied Trades section of the New York Board of Trade, after a meeting of its executive committee on Feb. 20th. The fall meeting will be held Sept. 25-26, 1947 at Shawnee Inn, Shawnee-on-Delaware, Pa.

Robert E. Healy, vice-president and advertising head of the Colgate-Palmolive-Peet Co., Jersey City, displays his 8 foot sailfish, hooked in the Silver Sailfish Derby held recently at West Palm Beach, Fla.

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# RAW MATERIAL MARKETS

**As of March 3, 1947**

ANIMAL fat supplies will be better in 1947 than in 1946, according to recent statements of authoritative meat industry and U. S. Department of Agriculture spokesmen. Edible and drying types of vegetable oils, on the other hand, will be shorter this year than in '46. Exceptions are soybean and linseed oils, which will be more plentiful in 1947.

Total supplies of fats and oils will be smaller in the first half of 1947 than in the corresponding period of 1946, according to a recent estimate of the U. S. Department of Agriculture. In outlining the situation in "The Fats and Oils Situation," it is stated that domestic output and imports are expected to increase moderately but not enough to make up for the loss in inventories. (Factory and warehouse stocks of fats and oils totaled 1,264,000,000 pounds on Jan. 1, 1947, which was 462,000,000 pounds less than on the same date a year earlier and about 950,000,000 pounds below the 1937-41 average for January 1. There will be about the same use of lard and fats used for soap, U.S.D.A. reports.

**Tallow at 25c Record!**

Tallow prices reached an all-time high—tank cars 25 cents, fancy; 24⅞ cents, choice; 24¾ cents, extra—March 6. Dealers' prices were 25½ cents (fancy industrial grade) tanks; 28 cents in drums.

In discussing "soap fats," the "Fats and Oils Situation" predicts a 5 to 10% increase in production of edible tallow and greases in the first six months of 1947. In the corresponding period of 1946, 907,000,000 million pounds were produced. Tallow production will be up but grease production (during the first six months) will be down because of reduced hog slaughter. Most of the increase in the combined total of inedible tallow and greases over last year will come in the period of April to June. In that quarter last year cattle slaughter was unusually small, partly because of the expectation that price ceilings would be removed in July and partly because short feed supplies curtailed grain feeding during the spring.

Imports of lauric-acid oils (including oil-equivalent of copra and babassu kernels) are likely to be larg-


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# KRANICH SOAPS

**MANUFACTURED FROM FATTY ACIDS DISTILLED AND OILS REFINED BY US**

**CONCENTRATED**

## LIQUID TOILET SOAPS

**30%-40% COCONUT**

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## LIQUID SOAP SHAMPOOS

**COCONUT and CASTILE**

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## POWDERED SOAPS

**Pure Coconut**
**U.S.P. Castile**

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## POTASH SOAPS

**Soft Potash 40%**
**Hard Potash 65%**
**U.S.P. XII Green**
**Pine Scrub 22%**

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Kranich Soap Company, Inc.

**54 Richards Street** **Brooklyn 31, N. Y.**

# KRANICH SOAPS

er in the first six months of 1947 than a year earlier. The increase in imports, together with increased domestic production of tallow, probably will more than offset the reduction of 115,000,000 pounds in stocks of soap fats on hand January 1, 1947, compared with a year earlier, it is reported by the U. S. Department of Agriculture. However, it is pointed out, since the use of lauric acid oils in food products is no longer prohibited, the quantity of fats going into soap manufacture may be about the same in the first half of this year as last year's comparable period. Total use of fats for soap (including secondary fatty materials and tall oil) in the first six months of last year was 990,000,000 pounds.

The price forecast for fats, oils and oilseeds for the next few months is "continued high." Some decline may come when marketings of the 1947 oilseed crops begin.

Currently, lard prices hold the spotlight as they move to new record highs. Although some resistance is believed to be developing to the steady upturn in oils and fats prices, export business is helping to keep prices up. New seasonal high prices for lard futures were established in Chicago during the third week of February when prices on the Board of Trade advanced to $27.50 a hundredweight. The number of hogs on farms on January 1 was 56,900,000 head, according to a U. S. Department of Agriculture estimate, which represents a decline of seven percent from a year earlier but about in line with trade expectations. However, the number of hogs was about 28 million head below 1944.

Another price increase on an important soap raw material that was announced early this month is an advance of 15 cents per hundred pounds in the price of solid caustic soda by one leading manufacturer. The new prices, effective as of March 1, are $2.65 per 100 pounds for 76 percent solid ammonia-soda in drums and $2.55 per 100 pounds for solid electrolytic caustic soda.

The insecticide supply outlook for 1947 is not much brighter than that of 1946, according to a recent report of the U. S. Department of Commerce. Although it is thought pyrethrum will not present much of a problem in 1947, some anxiety is felt for rotenone. It will be up to Peru to furnish us with this material in 1947. DDT may be tight in 1947, what with production heavily contracted for well into this year.

A number of price decreases characterized the perfuming materials market in the past month. Essential oils affected included geranium oil from Algeria; Mexican lignaloe wood oil; ocotea cymbarum oil; Ylang-ylang oil, bourbon; Brazilian boise de rose; natural Italian begamot and Ceylon citronella oil to mention but a few. Improved stocks and buyer conservatism combined to bring prices down. Price drops are accentuated by a "wait and see" attitude on the part of buyers who show a further disinclination to buy when prices begin to drop.

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# GREATER

# PRODUCTION SECTION

*More Observations for the Small Soaper on*

# CONTINUOUS PROCESSES

IT was pointed out last month in this section that technical evolution in the processing of soap would likely be in the direction of some form of continuous process. Already some of the unit processes involved in soap manufacture such as oil refining, tallow bleaching, crutching, and fatty acid fractionation are being employed quite generally on a continuous, production line basis, but it is only in some of the larger and most progressive plants that one will find evidence of complete continuous process from the splitting of the fatty oil glycerides to the wrapping of the cake or filling of the granule package. Framing of soap for the production of un-milled bar soap may be said to be on its way out of the larger organizations.

The reason for this, of course, is because the larger companies can afford to indulge in expensive and exhaustive research on all phases of the problem from laboratory, through pilot plant, and on to large scale production, and although they may be committed to tremendous initial capital outlay, they know pretty well the answers both technically and economically before they progress step by step and therefore the actual risk is small.

John Seaman, has pointed out a number of advantages and disadvantages of the Victor Mills process (*Soap & Sani. Chems.*, XXII, 10, P82, 1946) which were quoted in this section last month. The process does not appear to be within the interest of the small soaper at present. It is undoubtedly true that off-color fatty acids from the hydrolyzer can be cleaned up beautifully by distillation but it is not known to the trade that such a process, of itself, will yet provide a soap of the proper type for subsequent milling. Neutralization with cheaper alkalies such as soda ash also presents problems, but apparently it is satisfactory for "built" soaps. A big problem in high pressure-high temperature process is corrosion. In such type process where chemicals are being handled, the equipment must be given very careful attention. In some cases, all equipment must be gone over very carefully with X-ray in order that flaws can be detected and strains eliminated. Most high pressure hydrolysis equipment is stainless steel clad and is not only expensive but is scarce at present. Although such a process allows for low production costs, and only two men are needed for normal operation, the whole system has to be shut down from time to time for a complete going over in order to detect points of weakening and prevent breakdown during operation. Such a process is said to be economical down to a production of the order of a ton of fatty acids per hour, but below that the economics are questionable because of the high initial outlay. No data is available for estimating actual production costs of a smaller unit, however. It is said that the hydrolysis process may be licensed now from one of the large soap companies.

Another continuous process for soap making, the Clayton process (*Soap & Sani. Chems.*, XX, 9, P25, 1944) has been used with moderate success by a small soaper who stated that he had plenty of headaches in overcoming some of the difficulties inherent to the high temperature, high pressure flash saponification of the glycerides in a closed coil. During wartime operation, the company did not recover glycerine from the unit, but left it in the soap, and only soap powder was made from the flash saponifier. Again, a corrosion problem had to be overcome. The rate of corrosion increases very rapidly under conditions where strong, uncombined caustic is handled at high temperature and pressure. Coils of stainless steel are recommended for the flash saponifier and must be treated to remove all strains at the bends. More study must be made regarding the method of heating the coil. The comparative advantages of baffle plates and of high temperature heating liquids of the diphenyl-diphenyl oxide type deserve further investigation.

The quality of the soap produced showed it to be satisfactory for the average household laundry product. The process provided for the addition of builders during manufacture, but the moisture content was unusually low and an appreciable amount of the glycerine left in the soap was found to be decomposed to lower glycol fragments. This was claimed to be an advantage by the company, however, as this condition was said to improve the detergency and stability of the product and the powder had less tendency to cake and ball than does a soap powder containing an appreciable amount of glycerine. This much, however, may be said for the process: It has been used

Norda

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PRESENT reduced supplies of natural floral essences emphasize the value of high quality substitutes. Synthetic floral essences can be used to replace the natural oils with full satisfaction and marked success in numerous products,—toilet soaps, shampoos, shaving creams, powders, creams, and many others.

In fact, in many products the newer synthetic floral essences are to be *preferred* for the manner in which they reproduce the true fragrance of the living flowers in the finished product,—not to mention uniformity of quality and odor fidelity, and their economy under present conditions.

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with moderate success by a *small* soaper where the problem of glycerine recovery and that of producing soap stock for subsequent milling was not yet met. It was possible to control both the rate of production and quality of product within fairly elastic limits. A considerable production can be accomplished with only a moderate capital outlay and by the use of only two operators. The process is completely continuous, and can produce with ease 12,000 to 15,000 pounds of "friable" soap per 24 hours.

No further information has come to our attention regarding the methylation process by Bradshaw and Meuly (*Soap & Sani, Chems.*, XVIII, 5, P23, 1942) in which molten fat is mixed with methanol and caustic soda catalyst for about two hours at 180° F. to produce a separation of crude glycerine at the tank bottom and fatty acid methyl ester at the top. The ester is subsequently saponified with 30 per cent caustic soda and the methanol recovered. The method is susceptible to continuous process and spray drying can be employed. Anhydrous soaps can be produced and a separation of the glycerine from potash soaps can be effected. Limited production of milled soap was accomplished by this process during the war. The process, of course, uses a high-priced chemical but it can be recovered with reasonable efficiency. Power and equipment maintenance costs are extremely low because no high temperatures are involved. Quality of product is maintained.

No recent information has come to our attention regarding the progress being made with this process. however. About the same may be reported for the Sharples process the British patent on which was discussed in *Soap & Sanitary Chemicals*, April, 1943, page 59. Experimental work on the process is continuing at one of the large soap plants but no report has been forthcoming of late.

## Emulsion Stability Test

Emulsions are ordinarily intended to remain stable over a rather long period. A number of methods exist for testing emulsion stability, none entirely satisfactory. A reasonably accurate method for liquid emulsions is to centrifuge them at a uniform speed, checking the time elapsed before separation occurs, against the time taken by a known standard. Another method is to subject the emulsion to abrupt temperature extremes under controlled conditions. By testing for electrical conductivity in the disperse phase of water-in-oil emulsions, the presence of even minute quantities of water is detected, indicating instability.

An effective method which works equally well with oil-in-water and water-in-oil emulsions may be applied to both liquid and solid types. It is a rather delicate procedure but is worth the trouble involved. A sample of oil-in-water emulsion, for example, is put on a microscope slide under a low-power objective. Small quantities of an oil-soluble, water-insoluble micronized dye are dusted into the emulsion, using a finely drawn capillary for the process. If there are noticeable patches of color in the emulsion, the presence of oil in the continuous phase is indicated, denoting instability. By using a water-soluble, oil-insoluble dye, the same procedure may be applied to water-in-oil emulsions.

New emulsifying agents should be evaluated not only as to their applicability to present formulations, but also for future reference. The application of emulsions is growing steadily and expanding rapidly into new fields, making the knowledge of emulsion technique more and more specialized. I. R. Hollenberg. *Drug and Cosmetic Ind. 60*, No. 1, 50-1, 128 (1947).

## Evaluation of Refining

The degree of refining of an oil may be evaluated by means of surface tension and foam stability. On addition of 2 per cent of a crude oil to a refined oil, these characteristics appeared to change. This suggests that gums form a stable surface layer, shown by the appearance of a high surface tension. P. Desnuelle, O. Micaelli, and M. Naudet. *Inds. corps gras 2,* 240-6 (1946); through *Chem. Abs.*

## Slurry Setting Prevented

A number of samples of commercial bleaching materials were examined including high-test hypochlorites, ordinary bleaching powders, stabilized bleaching powders, and special products. Simple test procedures were devised for determining the set points of bleach-water slurries and the characteristics of setting up slurries of various types of bleaching materials were determined. It was found that, on cooling, slurries of some ordinary bleaching powders and stabilized products set to a pasty or gelatinous mass at temperatures above freezing. Setting was apparently connected with high calcium hydroxide content in the presence of considerable calcium chloride. Certain high test bleach-water mixtures set on mixing at room temperature; setting was apparently due to the hydration of calcium hypochlorite. The most effective means of preventing setting was the use of an antisetting substance. Of the materials studied for this purpose, sucrose was found to be the best. "Prevention of Setting of Bleaching Powder and Calcium Hypochlorite Slurries." Solomon Love and Jerome Goldenson, Chemical Corps Technical Command, *Chemical Corps. Journal*, pps. 39-42, January, 1947, Edgewood Arsenal, Md.

## Tri-glycerides in Fats

A method was worked out for determining tri-saturated glycerides in lard and tallow. Several samples of commercial lard contained about 2.5 per cent of tri-saturated glycerides, while a sample of edible tallow contained about 14 per cent. F. E. Luddy and R. W. Riemenschneider. *Oil & Soap 23,* 385-9 (1946).

## Spanish Soaps

Data on the analyses of 86 soaps marketed in Madrid showed that in over 90 per cent of these, the amount of filler was more than 5 per cent. The total fat content including the resin acids, varied between 12 and 84 per cent. Many soaps contained only resin acids, and many others over 60 per cent of such acids. M. de Mingo. *Anales fis y quim.* (Spain) *40,* 98-102: through *Chem. Abs.*

# *Aluminum Chloride—As You Like It*

Consistently uniform high purity is one reason why processors like to use Hooker Aluminum Chloride, Anhydrous. They know that here is one catalyst that will not "gum up" the works because of unknown impurities or changes in analysis from one shipment to another. Where smooth operations depend upon uniform purity of the Aluminum Chloride, you can depend on Hooker.

In Hooker Aluminum Chloride, too, you have a choice of three sizes from which you can select the one which will give you the best results.

Fine Grind .....an unscreened material practically all passing 20 mesh.

Coarse Grind ....unscreened, 1 mesh and finer containing 25 to 35% finer than 20 mesh.

Coarse Screened ..same as above screened to remove 20 mesh and finer.

Hooker Aluminum Chloride is being used as a catalyst in many Friedel-Crafts syntheses, polymerization, isomerization and halogenation. Practically free from iron (0.05% max.) it is especially desirable in the preparation of derivatives for use in the manufacture of high octane gasoline, lubricants, synthetic rubber, dyes, varnishes and pharmaceuticals.

Additional physical and chemical data on this important chemical are contained in Technical Data Sheet 714, sent when requested on your letterhead. Hooker's Technical Staff is also available for consultation and help on the application of Aluminum Chloride and the other Hooker chemicals to your purposes.

***SPECIFICATIONS***

**Hooker Aluminum Chloride, Anhydrous $AlCl_3$**
Gray, crystalline solid in three sizes.
Molecular Weight .....133.3

ANALYSIS

| | |
|---|---|
| Aluminum Chloride | 98.5 % min. |
| Iron | 0.05% max. |
| Non-sublimables in air at 950° C. | 1.5 % max. |

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Caustic Soda  Paradichlorbenzene  Muriatic Acid  Chlorine  Sodium Sulfide  Sodium Sulfhydrate

# Fat Hardening Process

METHOD and apparatus for hydrogenation of fatty acids and/or their glycerides, in which a mixture of fatty material and catalyst (not specified) is circulated in a vessel in a finely divided state in a hydrogen atmosphere, and is heated up to 230° C. or more immediately before being led into the reaction zone. Apparatus comprises a container in which is placed a vertical circulation tube through which the mixture passes, electrical heat source being placed in upper or central part of the circulation tube. Other heating methods may be used. Reaction velocity is said to be increased through high thermal conductivity of hydrogen which thus quickly reaches a high temperature with corresponding increased reactivity. The streamlined form of the lower end of the apparatus is important: it ensures steady even flow and prevents settling at the bottom of the metal catalyst mixed with fat. Baffle plates or "conveyor scoops" deflect the flow of the mixture downwards. Hydrogen is admitted through a pressure valve which closes on reaching a predetermined pressure.

More effective hardening through increased speed or intensity of mixing. The mixture is forced upwards by a pump through a circulation pipe in the container. The pump is of the axial turbine type, with rotor and atomizing disk, so that the mixture is projected as an axially directed jet into the hydrogen atmosphere. Streamlining is again used in lower part of container. Cooling means are provided, together with charging and discharging means with vacuum or inert gas under pressure. The apparatus is claimed to be of safe and simple design.

Method of discontinuous (or batch) hardening of fatty acids and/or glycerides in which fat and catalyst mixture are circulated in contact with hydrogen and preheated by heat from previously hardened fat by passage through heat exchanger in storage container. The mixture coming from the hardening vessel flows in counter-current through the heat exchanger and into the storage container, whence it passes again into the hardening vessel. Hardened fat is forced through the heat exchanger by the inert gas current under pressure, in the same way that fat to be hardened is forced from the storage tank into the hardening vessel. After hardening, the temperature of fat-catalyst mixture must be reduced—e.g., from 190-219° C. to 80-120° C.—so that the catalyst may be filtered out without loss of quality. On the other hand, fat to be hardened must be heated up to 140° to 160° C. One object of this invention is economy in heating. Preheating is, of course, known in the continuous process, but a special method is claimed here for batch work.

Recent patent applications in Norway (dated April 30, 1945) and in Great Britain cover claims, in the name of Carl Fredrik Holmboe and De Nordiske Fabriker, De-No-Fa Akt. of Oslo. *Chem. & Eng. News,* Jan. 1947.

## Diphenyl Sulfonates

A variation of the alkyl aryl sulfonate type of surface-active agent was introduced not long ago with the use of diphenyl as the fundamental ring system instead of benzene. "Areskap", recommended mostly as a wetting agent, is 2′-hydroxy-3-butyl diphenyl-5-sulfonate of sodium. The "Areskit" brand is a variation in which the phenolic hydroxy group has been omitted, making it more suitable for insect sprays. The "Aresklene" brand is the same as the Areskap but with another butyl and another sulfonic group, making it more suitable as an emulsifying agent. C. Z. Draves. *Am. Dyestuff Reporter 35,* 661 (1946).

## Tobacco Seed Oil

The composition of tobacco-seed oil varies according to the species and the soil. The oil is obtained by simple or double pressing or by pressing followed by extraction with an organic solvent. The quality of the oil is influenced by the temperature of the seed during pressing. Average percentages of fatty acids found were palmitic and stearic 3.7, oleic 31, and linoleic 65.3. The oils do not seem to contain any alkaloids or other constituents harmful to health and may be hydrogenated for edible use. E. Briquet. *Mitt. Lebensm. Hyg. 36,* 206-16; through *Chem. Abs.*

## Hardness Determination

A method for the determination of total hardness in water is based on the comparison of the quantity of soap solution used for the titration of the sample water with that of the same solution used for the titration of standard samples of water of known hardness. The soap solutions were prepared by dissolving soap in 40 per cent alcohol in quantities of 1-2 per cent by weight of soap dried for 24 hours at 30-40° C. The solution is allowed to stand for 1-2 days and filtered. Various standard solutions of water were prepared.

The advantages of this method over ordinary soap methods are that any kind of soap can be used, the solutions are simply prepared, and accurate and rapid recognition of the titration end point is possible. The end point is marked by formation of a foam which persists on the surface for 5 minutes. The time required for construction of the calibration curve is one of the disadvantages of the method. E. N. Teterkin. *Zavodskaya Lab. 12,* 177-8 (1946); through *Chem. Abs.*

## Raman Spectrography

Spectograms obtained with lower fatty acids suggest that the higher fatty acids, the glycerides of which form the principal constituent of fats, can be identified by Raman spectroscopy. By molecular distillation it may be possible to effect sufficient purification so that the identification will be very distinct. The presence of certain lower fatty acids can be detected and the double bond of unsaturated compounds is indicated clearly. By measuring the intensity of the ray, a good idea of the quantity can be gained. A. van den Hende. *Bull. soc. chim. Belg. 54,* 88-95; through *Chem. Abs.*

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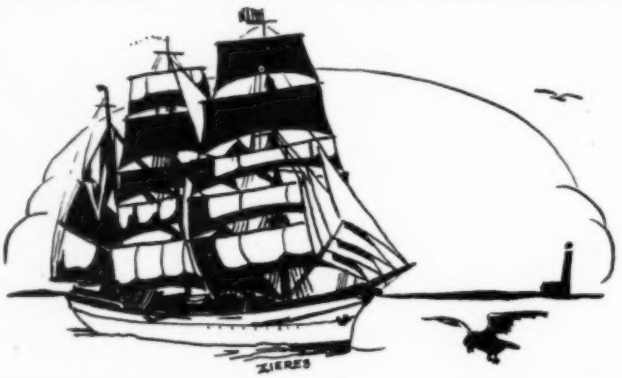

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# Laundering Techniques

PROPER classification of garments in laundering is very important. Colored cotton fabrics are divided into "fast" and "fugitive" colors. This separation can only be made on the basis of color and type of fabric, as it is obviously impossible for the operator to test the fastness of the dye present in each article. Experience has shown that a segregation into the following classes of work is usually satisfactory:

Fast colors

(a) Cotton shirts in printed patterns or solid shades, of light blue, grey and green.

(b) Other types of cotton wearing apparel in these shades, either solid or as prints.

(c) Cotton wearing apparel in light pinks, oranges, tans and yellows.

Fugitive colors

(a) Cotton wearing apparel in dark blue, green, brown and black.

(b) Cotton wearing apparel in dark reds, oranges and scarlets.

The fast-color classifications are washed in a formula in which both the temperature and alkalinity of the various suds baths are reduced below those employed with white cotton or linen, specifically, at a maximum temperature of 130°F. and a pH of 10-10.5. Fugitive colors are washed in a formula in which the temperature is lowered still further and no alkali is used, that is at a temperature of 100-110°F. and a pH about 10. No bleach is used in either colored work formula. However, white shirts with colored woven stripes are usually given a bleaching treatment, since the dyes present are normally fast to chlorine bleaching.

For certain classes of work, starch-type sizing agents are added in an operation following souring. Recently considerable use is being made of water-repellent finishes added in the form of an emulsion in an additional operation following souring. The use of water-repellent finishes is of great value in reducing the intensity of soiling sustained by such articles as table cloths, uniforms, etc. through contact with aqueous soiling agencies during use, thereby increasing their ease of laundering.

The formula used in laundering *silks and rayons* is similar to that employed in the fugitive classification, except that in order to reduce the extent of mechanical action during laundering, use is made of small washers operating at low speeds such as 10-15 r.p.m. Colored articles are among the most heavily soiled materials handled owing to the fact that such articles are frequently worn for longer periods. Owing to the necessity of employing a less drastic formula than is used with white work, the degree of sterilization obtained in the first part of the formula is markedly less. The bactericidal effect of the souring operation makes it possible to turn out a load which is practically sterile.

The typical *wool formula* makes use of every device known to avoid shrinkage. Relatively high concentrations of soap, that is 0.3-0.5 per cent, are used in order to obtain a rich suds, also high water levels are employed, in small-diameter, low-speed wheels. All of these procedures are designed to reduce to a minimum the amount of mechanical action which the load receives. In wool washing the maximum temperature is 100°F. Neutral soap without added alkali is used, and the time of processing is reduced to a minimum.

Test pieces have proved very useful in the control of laundering and dry-cleaning operations. Those used in the control of whitework washing consist of a piece 20 by 36 inches of lightweight cotton nainsook, to which are attached (a) a piece of cotton drill carrying a standard carbon soil applied in the laboratory; (b) a piece of bleached cotton drill; and (c) four small pieces of light cotton fabric carrying a sulfur-black dye which is progressively faded by repeated bleaching with hypochlorite. These last pieces are removed from the test piece after 5, 10, 15, and 20 launderings respectively.

The test piece is pinned to a laundry net in a regular load, and the process repeated 20 times, after which the piece goes to the laboratory for examination. There they are examined for degree of whiteness, determination of breaking strength of the nainsook, cuprammonium fluidity of the same fabric, and observation of the degree of fading of the dyed pieces.

For testing colored washing operations, a similar test piece of nainsook carries the soiled cotton drill, and four standard dyeings of increasing fastness of laundering, one of which is a blue vat dye fast to laundering in the absence of hypochlorite but changing to a greenish blue in its presence. Ratings are made in the laboratory, after 20 washings, as to soil-removal efficiency, extent of fading of dyed cotton, breaking-strength loss, and chemical damage.

Some 500 of these test pieces are issued annually to members of the Canadian Research Institute of Launderers and Cleaners. During the ten-year period in which this test service has been in operation, the extent of breaking-strength loss and chemical damage has been steadily reduced and now stands at a commendably low level. In obtaining this good showing there has been no sacrifice of soil removal or whiteness retention.

The test bundle used to check the efficiency of dry-cleaning operations is of a simpler type, consisting of a piece of bleached wool flannel about 4 by 9 inches, together with a similar piece of the flannel carrying a standard soil applied in the laboratory. The two pieces are pinned to a garment being cleaned and are given a single cleaning in one or other of the plant's classifications. Examination of the processed bundle permits assessment of soil-removal efficiency and of the power of suspending loosened soil and preventing its redeposition on the fabrics. The operator fills in a questionnaire giving the washing or cleaning formula used, which enables the laboratory examiners to make recommendations for improvements in processing. C. H. Bayley. "The Relationship of Textiles to Laundering and Dry Cleaning." pp. 4-10 (1946).

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# PRODUCTION *Clinic*

By DR. E. G. THOMSSEN, PH.D.

THE handling of labor and particularly factory labor has become increasingly difficult under our new labor laws. And even if labor laws are changed by the new Congress, management's problem will continue to be more difficult than it was in pre-Wagner Act days. While management is inclined to put much of the blame for this condition upon labor leaders and labor racketeers, it also forgets some of the grave errors in labor relationships made when it was in the saddle. Had autocratic management been a little more farseeing a few years ago, the headaches and heartaches of more recent years would have been less severe.

The outstanding characteristic of an American workman—insistence on freedom of action—is still overlooked by many plant officials in positions of authority. This affection for liberty and individual initiative is innate in all of us who have lived in this country. It represents the reason why many of our ancestors migrated to this country, and has become inbred in all of us.

The institution of rigid rules of conduct for factory discipline may cause more harm than good. At first improvements result, efficiency is stepped up, profits increase and every one seems happier. Then differences of opinion creep in, and to enforce the rules there must be an autocratic resort to threats, punitive measures and discharging of employees. This builds up more resentment and when the underdog gets into power, he resorts to the very procedures he has been subjected to. In our country we have

gone through the dictatorship of management, the dictatorship of government and the dictatorship of labor since the twenties. All of these dictatorships have failed because we as individuals prize this freedom of action or personal liberty above all else. We do not like back seat drivers who tell us what to do. When someone dictates to us, we balk. This is as true of the most menial laborer as it is of the top boss.

Up-to-date production managers who have realized this characteristic use it to advantage rather than trying to ignore it or suppress it. We have heard a lot of tirades about regimentation of government, yet some Bourbons in factory management still try to enforce their unreasonable wills upon employees and at the same time cuss anyone who interferes with their own personal liberties. Under the guise of factory discipline they lay down rules for workmen which are distasteful to themselves. A common example is smoking. They will have "No Smoking" signs displayed prominently all over the plant and then chain smoke themselves all day long in their own offices. While this may be a small matter, it builds up ill will on the part of the employees who are denied this same privilege. It is no wonder then that under labor's new freedom one finds workmen smoking as freely as did the boss under the old regime.

Since this natural desire to have the same privileges as the boss is inherent in workmen, not only in smoking but in similar personal rights, it is also present in qualifications which go to make for leadership. This love of liberty makes most workmen desire to boss and lead rather than be bossed and be led. To cater to this desire, and use it profitably, production executives use various methods. There is nothing new in this idea, but it is too frequently overlooked. Even some labor unions instill the idea into their members to work with rather than against the employer.

The good fortune of being in a position of an overseer does not necessarily denote that those who must take orders are necessarily without talent. Many workmen have greater intelligence, more inventive genius and better ideas than some of the foremen over them. When they realize this and cannot give vent to their knowledge freely it is hard to take orders. The up-to-date production manager realizes this and permits employees to make suggestions, and goes to them for advice. This can be done by asking them directly in a frank manner, through the use of suggestion boxes placed around the plant into which written suggestions may be dropped, or by questionnaires which can be answered anonymously. Prizes are often offered as an incentive and posters or blackboards are used upon which the names of those making the best recommendations are prominently displayed. Men like to see their names in print. In some plants seminars are held on company time at which production problems are discussed by workmen and management. Such seminars can discuss not only possible improvements in production methods, but also fac-

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tory rules and regulations. Of course such meetings must be judiciously carried on, or embarrassing situations may arise. When properly conducted, much good has resulted from them.

In the future, workers will continue to insist upon more say about their jobs. Even more restrictive labor laws will not prevent this. It is a prudent policy for management to take the lead in getting labor's greater confidence, rather than to have regulations forced upon a business by outsiders who have less interest in the workmen than the persons for whom or with whom he works.

### *Pure Wood Cellulose Fiber*

The Industrial Chemical Sales Division of W. Virginia Pulp and Paper Co., New York 17, is known for its development of a number of chemical products. Among these of interest to soap and sanitary chemical manufacturers, are "Nuchar," an activated carbon, "Liqro" and "Indusoil," crude and refined grades of tall oil and "Snow Top" calcium carbonate. More recently they have come into the market with "Polycel," a chemically pure wood cellulose fiber. This is available in various fiber lengths in bleached, unbleached and colored grades. It runs uniform, is readily available and is low in cost. The applications are varied and "Polycel" may be used for numerous purposes in the detergent and insecticide fields. Samples and full information regarding its properties may be had by addressing the company.

### *Germicidal Vaporizing Device*

The Perfection Stove Company of Cleveland, Ohio, is distributing locally an electrically operated vaporizer that volatilizes disinfecting vapors. These consist of ozone and pinene and claims are made that these vapors are beneficial in certain human disorders. These assertions are said to be based upon laboratory tests which have verified these germicidal and non-irritating characteristics.

## New Folder on "Pittchlor"

A new folder on "Pittchlor" a calcium hypochlorite preparation with 70% available chlorine, was released late in February by Columbia Chemical Division of Pittsburgh Plate Glass Co., Pittsburgh. The folder describes the use of "Pittchlor" in the destruction of bacteria and molds, the sterilization of equipment and working areas, the elimination of odors and the purification of water. "Pittchlor" is used in the laundry industry as a germicide, deodorant, and bleach; in the food industry as a sterilizing and rinsing agent, germicide and disinfectant; and in hotels, clubs, hospitals, and institutions as a disinfectant, germicide and deodorant. Tables are offered for making up proper strength solutions for various uses.

## Griffin Issues Booklet

"Light Hydrocarbon Properties" is the title of a new handbook-style tabulation issued by Griffin Chemical Company, San Francisco. The booklet presents, in tabular form, hydrocarbon and light petroleum liquid and gas properties, with thermal data and data on combustion. Blank columns are provided for insertion of additional data as they are developed.

## Production Loss Check-Up

Application of a new management technique, whereby production loss by workers and machines can be determined accurately in a small fraction of the time required for ordinary production studies, was announced in mid-February by Consolidated Management Consultants, New York industrial engineering concern. The new system, designated as the CMC Production Loss Check-Up, is based on statistical sampling principles widely used in the field of market research. The new system measures time loss due to low productivity, idleness, breakdowns, bad material, faulty planning or other causes. A large number of observations are recorded over a period of a few days and are analyzed by precise mathematical formulae after a complete list of the factors comprising the work done in a particular department has been compiled. The factors are separated into "productive time" and "non-productive time" and the latter group is broken down into "avoidable" and unavoidable" time losses.

The new technique, according to the company, can be used to demonstrate actual productivity in a given plant or department, reasonable or potential productivity, where savings can be made by specific type of loss, the ratio of machine, equipment, and personnel utilization, reduction of inventory, and other aspects of production. The company emphasizes that the new system will not take the place of time and motion studies, or establish production standards for which it has not been designed.

## Storage Tanks of Lucite

News of the development of transparent storage tanks of "Lucite" acrylic resin was released in mid-February by E. I. du Pont de Nemours & Co., Wilmington, Del. The new-type tanks are particularly useful for the storing of chlorine bleaching solutions and should replace the tanks of concrete lined with a conventional sealing solution, claimed the company. The plastic tanks are expected to last indefinitely and are reported to be extremely light in weight as compared with the concrete tanks. Measuring 36 inches in diameter and five feet in length, the plastic tanks are constructed of ¼ inch sheet "Lucite." No liquid level indicators or float mechanisms are necessary since the transparent plastic allows constant observation of the contents.

## Sprayer-Duster Catalog

A two-color, fifty page catalog, No. 47, describing hand-pump and power type sprayers and dusters for agriculture and industry was recently issued by Dobbins Mfg. Co., Elkhart, Ind.

## New Pressure Filter Folder

A new pressure filter, "Pur-O-Cel" is now available from Proportioneers, Inc., Providence, R. I., and is described in a folder released recently by the company. The filter utilizes thin mats of diatomaceous earth rather than a sand bed and is of the pressure type, useful for small water treatment plants and all swimming pools. It is said to produce clear, brilliant water, removing all amoebic dysentery cysts and many bacteria. Other models will soon

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be available to filter fluids such as oils, micella, cleaning fluids, liquid soaps, etc. Due to its compactness and rapid filtration rate, the "Pur-O-Cel" filter is much smaller than a sand filter of the same capacity and thereby saves floor space. Backwashing the filter for cleaning is easily accomplished without disassembling the unit and with a comparatively small volume of water.

### Solexol Process Brochure

A 10-page brochure, "Prescription for Glycerides," presenting the technical story of the "Solexol" process for the refining of vegetable, animal and marine oils, was released early in February by M. W. Kellogg Co., process engineers, New York, and Jersey City, and is available upon request from the company. The booklet presents in text, photographs and tables, descriptive and yield data on the use of the process in refining tallow, soybean oil, sardine body oil, linseed and shark liver oils, and fatty acids, together with information on possible uses of the fractionated products. It also includes an analysis of the economic advantages of the new refining principle. (Edit. Note: see *Soap & Sani. Chem.* XXII, 12, 1946, P75.)

### Chlor-Organics Booklet

A new, 25-page booklet, "Organic Chlorine Compounds," presenting the latest data on twelve chlorinated compounds, industrially important as solvents, fumigants, and chemical intermediates, was released in mid-February by Carbide and Carbon Chemicals Corp., New York. It is one of a series of publications on the various groups of aliphatic organic chemicals and is available from the company upon request. Information is given on the properties and uses, specifications, solubilities, comparative stability to reducing and oxidizing agents, and constant boiling mixtures. The booklet also contains charts showing the variation of certain properties with respect to temperature. A comprehensive bibliography is also included. This publication should prove a useful reference source for research chemists, laboratory technicians, and purchasing agents in the industry.

### Organic Nitrogen Booklet

"Organic Nitrogen Compounds" is a new 31-page booklet recently published by Carbide and Carbon Chemicals Corp., a unit of Union Carbide and Carbon Corp., New York. This booklet presents in detail the properties, specifications, and uses of the alkyl amines, alkylene amines, alkanolamines, and acetoacetaryamides used in emulsifying, neutralizing, synthesizing, dissolving, and saponifying, etc.

They are used as intermediates in detergents, textile softeners, antimalarials, and pharmaceuticals. Some newer uses for amines include ion-exchange and water-softening resins, germicides, flotation agents, and petroleum emulsion breakers.

### Research Organization

How to organize a working industrial research department is the subject of a new handbook just published by the Standard Oil Co. of California, San Francisco, under the title, "The Coordination of Motive, Men and Money in Industrial Research." The survey on which the handbook was based enlisted the experience of a number of large industrial organizations which have had extensive experience in industrial research.

### Antioxidant Pats. Reviewed

A publication embracing resumes of United States patents, foreign patents and literature, from January 1938 through December 1946, will be published about April as Volume II of a former digest published by Paul D. Boone in 1938, entitled "Antioxidants for Fatty Oils and Compositions Containing the Same."

Mr. Boone, a Washington patent attorney and former associate examiner in the United States Patent Office, published Volume I shortly after he resigned from the Patent Office, after examining fatty oils for about ten years. The second volume will be published jointly by Mr. Ralph B. Deemer, formerly associate chemist in the United States Department of Agriculture, and Mr. Boone. It will be divided into chapters based upon the chemical composition of the antioxidant, and will be adequately indexed. Patents will be arranged numerically and by country in each chapter. It is understood that the sale price will be $100.00. Volume I will probably be reprinted at $100.00.

### TGA Proceedings Booklet

The semi-annual booklet entitled, "Proceedings of the Scientific Section of the Toilet Goods Association, Inc.", was recently released by Toilet Goods Association, New York. The final 1946 issue, number 6, contains a number of interesting articles for the soap maker such as: "Special Problems in the Multiple Patch Testing of Soap" by Robert R. Schwartz, M.D., and Emanuel J. Marcus, New York Dermatological Laboratory; "Originality in Perfume," by Henri Robert, Henri Robert, Inc., New York; and "Surface Active Agents in Cosmetic Practice," by I. R. Hollenberg, Van Dyk & Co., New York. The booklet is of 54 pages and is priced at $1.50.

### Brochure On Name Plates

A new and colorful brochure on name plates was recently released by Palm Brothers Decalcomania Co., Cincinnati, makers of decals, valances, and advertising signs. The brochure of slide-off decals is provided with a seven inch scale for quick reference to sizes of the various decals. Many new ideas for marking trade-marks, operating instructions, and other such information on packaged products and carriers are offered.

### New Rotary Rinser

A new, power-operated rotary rinser and cleaner was announced recently by U. S. Bottlers Machinery Co., Chicago. The new rinser is designed for cleaning any size and shape of bottle or jar up to gallon size. The unit has few moving parts, all of sturdy, long-life construction. Two operators can handle 50 to 135 per minute of quart size containers or smaller. Containers of gallon size can be run at a rate of 10 to 27 per minute. All parts coming in contact with water sprayed into the containers are of bronze construction. Apron supports and centering device are of stainless steel.

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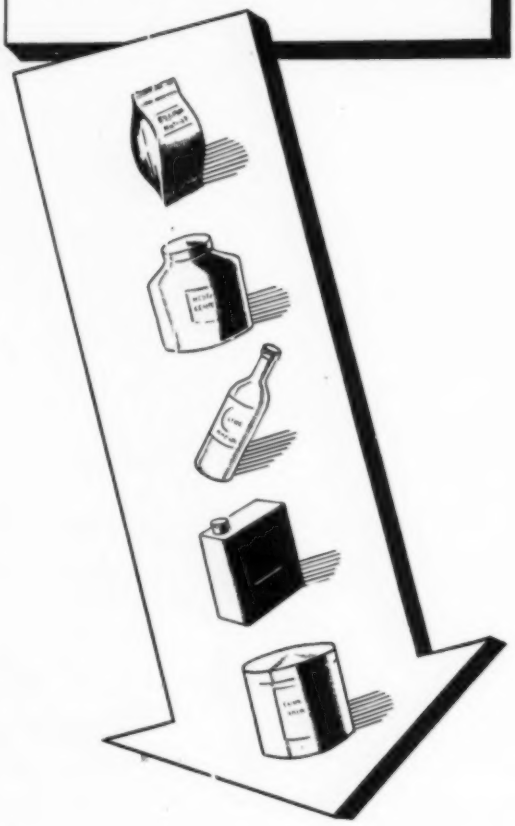

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# PRODUCTS AND PROCESSES

## Germicidal Detergents

Higher alkyl amine salts are combined with quaternary ammonium compounds to produce germicidal detergents which lather freely in water. In an example, 200 grams of a 75-25 mixture of octadecyl amine hydrochloride and hexadecyl amine hydrochloride is mixed with 50 grams of [*para-tert*-octyl phenoxy ethoxyethyl] dimethyl benzyl ammonium chloride. The product is a nonirritating soaplike preparation with good disinfectant and lathering qualities. A. L. Rawlins, to Parke, Davis & Co. U. S. Patent No. 2,406,902.

## Patents Stain-Removers

Two new patents on stain removers based on polyethylene glycols have just been issued, according to Carbide and Carbon Chemicals Corp., New York, the assignee of both. Copies may be obtained from the company or the U. S. Patent Office.

U. S. Patent No. 2,393,865 covers the manufacture and use of water-soluble- wax-like sticks useful for removing stains such as those caused by ink, coffee, tea, iodine, and grass. In removing the stain, two sticks are used; one of solid polyethylene glycols or "Carbowax" compounds containing an acidic salt of triethanolamine and oxalic acid, and the other of solid polyethylene glycol containing powdered sodium bisulfite or other reducing material. First, the spotted fabric is laid on a clean under-cloth, and as much of the stain as possible is removed by cleaning it with a water-filled sponge. Then the acidic stick is applied by daubing until no more stain shows on the under-cloth. The spot is again rinsed, and finally the reducing stick is applied until the spot disappears.

The second patent (U. S. Patent No. 2,393,866) covers tarnish-remover compositions based on polyethylene glycols (usually "Carbowax" Compound 1,000) and suitable materials, such as a wetting agent, an abrasive, and/or frequently a solvent-type organic compound such as triethanolamine oxalate. The tarnish removers described are useful on silver, gold, copper, brass aluminum, or other metals and are excellent for household use.

## Floating Bath Soap

Portable kettles are sometimes used in making floating bath soaps, mounted on wheels so as to be connected anywhere that steam and power are available. Capacity must be ample to allow for frothing up on aeration. Although hook-shaped stirrers and paddles are utilized, the best aeration is obtained from the wire-brush type of stirrer, as the heating is thereby intensified. Overhead pulleys are geared to transmit power to this wire brush, while a worm-operated tilting device simplifies the discharge of the finished material.

Only the lower half of the kettle has to be jacketed, as it is not desirable for the heat to increase frothing too much. A portion is introduced for heating, followed by other portions as indicated. The kettle should not be more than three-fourths full.

Once a uniform mass is produced and allowed to cool to 25°C., the specific gravity may be tested automatically and recorded in a small vacuum instrument. One arm of this is filled with water, the other arm draws up the liquid soap. The difference in height under the same vacuum shows the density. Efforts have been made to develop this as a regular recording instrument, so as to eliminate the need for individual testing of samples, but so far it has only been used for works' purposes and has not been placed on the market.

A number of manufacturing perfumers simply purchase white curd soap and beat it to a lather together with waste cuttings. Coloring matter ground up in oil is then added, followed by perfume. A good fragrant odor is produced by use of 60 grams of rose oil, 50 of bergamot oil, and 10 of geranium oil per 100 pounds of soap. This has to be incorporated before a thick froth has been developed. The problem of loss of odor can be minimized by great care in timing.

Ordinary soap frames may be used, preferably not too tight at the bottom so as to permit any surplus lye to trickle out, if a finished soap was not used. Since aerated soap is fairly light, it will not easily run out. The solidified soap is cut in bars with fine steel wires and the bars are reduced to cake form for the final stamping. A. G. Arend. *Perf. & Ess. Oil Rec.* 37, 363-5 (1946).

## Oils and Waxes from Coal

The Fischer-Tropsch process for the synthesis of hydrocarbons from carbon monoxide and hydrogen, was operated in Germany in nine plants during the period 1939-44. The reaction products, mainly straight-chain paraffins and olefines, were recovered by cooling and adsorption on active carbon. They were fractionated and stabilized by conventional methods. The proportions of the various fractions obtained were as follows:

| | *Yield in % by Weight* | |
|---|---|---|
| *Fractions* | *Atmospheric Pressure Process* | *Medium-pressure Process* |
| | % | % |
| $C_3$ and $C_4$ chains..... | 14 | 10 |
| Distilling at 30-165°C. | 47 | 26 |
| Distilling at 165-230°C. | 17 | 24 |
| Distilling at 230-320°C. | 11 | 13 |
| Soft wax at 320-460°C. | 8 | 17 |
| Hard wax over 460°C. | 3 | 10 |

The $C_3$ and $C_4$ hydrocarbons were liquefied by compression and were sold mainly as fuel. The fraction distilling at 30-165°C. was sold as low-grade gasoline for blending, and the 165-230 fraction as high-grade Diesel oil for upgrading low-quality tar and petroleum oils. The fraction distilling at 230-320°C. was mainly converted into "Mersol" detergents for use as soap substitutes, by sulfochlorination followed by saponification. The bulk of the soft wax was oxidized to produce fatty acids, the main fraction of which was used for soap manufacture. Most of the hard wax was used in the wax industry for polishes, etc. C. C. Hall. *The Chem. Age 55*, 569-70 (1946). (Edit. note: for more on this process, see: *Soap & San. Chem.* XXII, 10, P75, 1946).

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Improves foaming qualities

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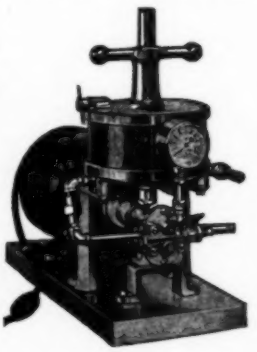

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# NEW PATENTS

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**Complete copies of any patents or trade-mark registration reported below may be obtained by sending 50c for each copy desired to Lancaster, Allwine & Rommel. Any inquiries relating to Patent or Trade-Mark Law will also be freely answered by these attorneys.**

No. 2,412,945, **Detergent Composition and Method of Preparing Same,** patented December 24, 1946 by Frederick C. Bersworth, Verona, N. J. A product of manufacture consisting of the reaction product of an aliphatic polyhydroxy alcohol and an alkali metal salt of a lower alkyl amino polyacetic acid, said reaction product being formed by heating the said salt in aqueous solution with at least 15% by weight of said alcohol to temperatures within the range 115-200° C. for an extended time interval effective to vaporize the major portion of the water therefrom, said reaction product thereby obtained being characterized by being highly soluble in water, by being non-reactive with salts and electrolytes present in the water to form insoluble compounds therewith, by being a strong detergent in aqueous solutions, and by being miscible in all proportions up to equal amounts by weight with alkali metal fatty acid soap compounds without detriment to the bar, flake and powder forming properties of the said soap compounds, and by imparting to said soap compounds strong foaming properties in the presence of dissolved salts and electrolytes without the formation of insoluble soap compounds therewith.

No. 2,412,979, **Manufacture of Milled Toilet Soap,** patented December 24, 1946 by James Garvey, Vancouver, British Columbia, Canada, assignor to Arthur Garvey and Horace Maseline Garvey and said James Garvey, all of Vancouver, British Columbia, Canada. Apparatus for producing a soap bar with continuous design of indented cross-section extending axially therethrough, which comprises a plodder having a restricted opening at the forward end thereof and means for feeding plastic soap to said opening and extruding it therefrom, a tube extending into the plodder from the rear end thereof towards the forward end and designed to permit a preformed soap rod having the cross-sectional dimensions of the desired design to pass freely therethrough, said tube being open and accessible at the rear of the plodder and terminating at its forward end, between said opening and the forward end of said feeding means, in a portion of appreciable length having the indented cross-sectional shape both internally and externally of the desired design but having inside cross-sectional dimensions just slightly greater than those of the desired design, whereby a preformed soap rod having the cross-sectional dimensions of the desired design may just pass freely through said portion.

No. 2,413,009, **Processes of Refining, Purifying and Hydrogenating Fats, Fatty Acids and Waxes,** patented December 24, 1946 by Ilona Taussky, New York, N. Y. In the process of refining a substance selected from the group consisting of fats, fatty acids and waxes, the step of subjecting an intimate mixture comprising said substance to be refined and a small percentage of a finely divided spent hydrogenation catalyst to hydrogen pressure between fifty and seven hundred and fifty pounds per square inch at a temperature slightly about 212° F.

No. 2,413,405, **Fumigant,** patented December 31, 1946 by Frank Leslie Campbell, Rockville, Md., and Willis Conard Fernelius, Dayton, Ohio. As a new composition of matter, the addition product of ethylene oxide and sulfur dioxide having the formula $(CH_2)_2O.SO_2$.

No. 2,413,495, **Phosphoric Acid Detergent Composition,** patented December 31, 1946 by Charles P. Given, Washington, D. C., assignor to Virginia-Carolina Chemical Corporation, Richmond, Va. A detergent composition comprising an aqueous solution of phosphoric acid containing an aqueous emulsion of di-isobutyl phenyl diglycol ether sulfonate, and triamylamine, characterized by high non-corrosive property towards metals due to the synergistic corrosion inhibiting property of the ether sulfonate and triamylamine, one hundred percent by weight of the composition comprising from 4% to 15% of the ether sulfonate emulsion, from 20% to 53% of $H_3PO_4$, and from about 0.1% to 0.3% of triamylamine, the ether sulfonate emulsion containing 30% of the ether sulfonate.

No. 2,413,627, **Parasiticidal Composition,** patented December 31, 1946 by William F. Hester, Drexel Hill, and W. E. Craig, Philadelphia, Pa., assignors to Rohm & Haas Company, Philadelphia, Pa., a corporation of Delaware. A parasiticidal composition containing as the sole fungicidal and insecticidal agent the copper salt of a N-acylated amino acid selected from meta-aminobenzoic acid and para-aminobenzoic acid as a carrier therefor.

## Hood Buys Moonshine

Expanded production and sales outlets in new territories are claimed by Hood Chemical Co., Pittsburgh as a result of the purchase of Moonshine Chemical Co. of the same city. According to a Hood announcement late in February, the acquisition of Moonshine's stock and production, warehouse and distribution facilities marks the third major move of expansion by

## CMC Co. Sales Conference

**Members and guests of Cleaning Materials & Chemicals Co., Pittsburgh are gathered before a dinner which concluded the company's annual sales conference held February 3d at the Hotel Henry, Pittsburgh. Edward Gallup, executive secretary of Western Pa. Hotel Men's Association was the principal speaker. The firm enjoyed in 1946 its best year of business since its beginning in 1927. E. G. Rogers, general manager, formerly with Colgate-Palmolive-Peet Co., Jersey City, and Irwin J. Mervis, director of sales, presented plans for the expansion of the business into Virginia, West Virginia, and western Pennsylvania.**

**In the picture are:** (reading left to right) **Dr. Dewitt Zeurner, Supt. North Braddock Public Schools; Wm. J. Barron, Supt. Shadyside Hospital, Pittsburgh; and Col. E. L. Gallup. Standing in the first row** (reading from the fifth gentleman left to right) **are: C. J. Engel, secretary and treasurer of the company; D. C. Mervis, president; E. G. Rogers, general manager; and I. J. Mervis, sales manager. Out of town guests present were L. H. Lipman, president of Miranol Chemical Co., New York; J. S. Bigsby, industrial sales manager, Allen B. Wrisley Co., New York; Mr. Grant and Mr. Dutney of S. C. Johnson Co., Pittsburgh; H. Ziegler, Gulf Oil Co.; C. C. Peters, Dixie Cup Co.; and Bernard Freudenthal, Chemical Service Co., Baltimore.**

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Cetyl dimethyl ethyl ammonium bromide —a white powder.

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Octadecenyl dimethyl ethyl ammonium bromide supplied in solutions with Isopropanol.

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Hood in recent months. In December, 1946, Hood Chemical Co. acquired the Beacon Products Corp., Philadelphia, and its two subsidiaries, the Mars Chemical Co., Chicago, and the Blanco Products Corp., Dallas. More recently the company purchased the Crescent Chemical Corp., Philadelphia. The Moonshine Chemical Co., producers of bleach, liquid wax, rug cleaner, and other cleaning products under the name "Moonshine," and "Sof-en-it" water softener, will continue to operate under its own identity.

### Harris Changes Name

Milton Harris Associates, Washington, D. C., consulting firm, announced late in February a change in name to Harris Research Laboratories and the formation of a new organization, Harris Instruments, Inc., The laboratories will be staffed by the personnel of the present organization, which consists of 30 chemists, physicists, engineers, etc., and will continue its same program of research, development, and consultation for the textile and allied industries. Harris Instruments, Inc., will conduct instrumentation research and develop and manufacture new research instruments, especially for the textile industry.

### Brass Cleaner

An alkaline solution known as "Enthone Brass Cleaner" is sold by Enthone, Inc. of New Haven, Conn. It can be used as a general plating-room cleaner and for soak-cleaning on copper, brass, bronze, nickel, silver, tin, and lead. Special alkalis are blended with surface-active materials to give a pH of 11-12.

### Removing Markings

To remove printed markings from cotton fabrics, prepare a solution containing 1 gallon of a dry-cleaning spotting compound—"Pyratex," "W.P.R.," or "Trisol" (or similar preparation), add 1 pint of acetone and 1 pint of amyl acetate. Wet out the marked portions of the garment and allow to stand for an hour. Then brush the spots vigorously using a fairly stiff brush dipped in the same mixture. Repeat the brushing process, using a hot solution of soap and alkali, about 2 ounces of soap and 1 of soda ash or sodium metasilicate. Finally put the garments through a regular wash. C. H. Bayley. *Bull. Can. Research Inst. Launderers and Cleaners,* Jan. 1947.

### Fatty Acid Esters

The esterification of fatty acids with excess pentaerythritol in boiling phenol gives mainly monoesters which can be isolated by fractional crystallization. Their properties make them suitable as emulsifiers. Eight molecules of pentaerythritol with stearic acid yielded about 82 per cent of monoester. P. Savary. *Bull. matieres grasses inst. colonial Marseille 30,* 84-7 (1946); through *Chem. Abs.*

### Elgo Trading Relocates

Elgo Trading Corp., New York, dealers in specialty products for the soap trade, report that on March 21st they will be located in a new office at 105 Nassau St., New York 7, N. Y.


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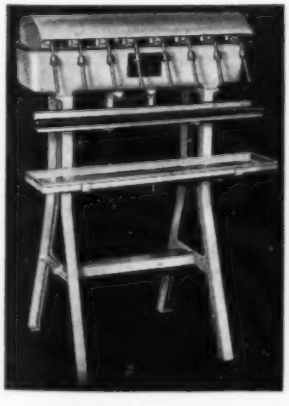

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| | |
|---|---|
| U. S. P. CRESOL | PYRIDINE |
| CRESYLIC ACID | XYLOL |
| U. S. P. PHENOL | CYCLOHEXANOL |
| TAR-ACID OILS | HI-FLASH SOLVENT |
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## SURFACE-ACTIVE CATIONS

(*From Page* 42)

exclusively surface phenomenon. Dye ions of large size have been shown to penetrate protein fibers, and similar penetration may be expected in cellular systems.

Kuhn and Jerchel (31) have treated yeast cells with surface active cationic tetrazolium compounds which become red when reduced, and have observed a red staining of the yeast. They conclude that the ions have penetrated and been reduced within the cell.

### *Miscellaneous Applications*

REFERENCE has been made to the widespread use of cationic materials in the textile industry. In addition to application from very dilute solutions, whereby they are exhausted onto the fabric, concentrated solutions are sometimes applied by brief immersion. It is perhaps encouraging that there have been no reported cases of dermatitis, either from the workers who have handled these solutions for several years, or from the wearers of the finished garments.

The ease and extent of exhaustion of surface active cations from solution may be determined in a variety of ways. Fig. 9 shows the loss of wetting power as a function of the number of 5 gram skeins immersed in a liter of 0.4 per cent solution of alkyl dimethyl benzyl ammonium chloride. After forty skeins had been immersed, the sinking time had increased from 10 to 35 seconds, indicating an approximate 50 per cent reduction in concentration, corresponding to the adsorption of an average of 1 per cent of active material based on the weight of the cotton skeins, in spite of the very brief contact time.

When applied to wool from faintly alkaline solutions, surface active cations are effective rewetting agents. The mechanism may be similar to that assigned by Taggart (32,33) to account for the hydrophilic character of surfaces treated with amines prior to froth flotation. On the acidic side, the polar end is turned towards the surface, and the hydrocarbon portion extends away from it, thus presenting a hydrophobic surface to which air bubbles will adhere. When an alkaline conditioning bath is used, it appears that a second layer is deposited, with its hydrocarbon portion touching that of the first layer, and the polar portion turned towards the solution, rendering the particle hydrophilic. He assumes reaction with metallic ions as the primary factor in adsorption.

Nicholson (34) has also investigated the effect of surface active cations on minerals. When wet sand is treated with surface-active cations, it is rendered more hydrophobic, so that asphalt or road oil can displace water from its surface and wet it more readily. Thus, hydrophilic aggregates may be made hydrophobic (or lipophilic). As an extreme case of adsorption on minerals, bentonites and some diatomaceous earths will remove large amounts of surface active cations from solution.

An interesting and important use of surface active cations is the addition to spinning baths in viscose

(*Turn to Page* 175)

CRESYLIC ACID — FORMALDEHYDE

High Boiling Tar Acids Tar Acid Oil

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## Ketones Aid Detergency

Ketones having 5 to 12 carbon atoms can be used as assistants with surface-active agents such as sodium alkyl sulfates, sodium oleate, and sodium naphthalene sulfonates, to increase wetting and detergent action. Increase in wetting power is shown by the average sinking time of a canvas disk one inch in diameter in a solution containing 0.3 gram per liter of sodium ditertiary butyl naphthalene sulfonate. (See table below.) Saturated solutions of these ketones may be used alone as wetting agents. Methyl, ethyl and propyl alcohols at concentrations of one gram per liter, may be used to produce a homogeneous mixture of camphor and the wetting agent. L. Leiserson, to Virginia Smelting Co. U. S. Patent No. 2,404,913.

| *Solution* | *Sinking Time in seconds* |
|---|---|
| Sodium ditertiary butyl naphthalene sulfonate | 63 |
| Same plus 0.8 cc. diisobutyl ketone | 38 |
| Same plus 1,1,3-trimethyl cyclohexan-5-one | 41 |
| Same plus 0.8 cc. *n*-amyl methyl ketone | 43 |
| Same plus 0.8 cc. isophorone | 49 |
| Same plus 0.8 cc. *n*-butyl methyl ketone | 51 |
| Same plus 0.8 cc. cyclohexanone | 54 |
| Same plus 0.8 g. camphor | 38 |

## Filled Soaps Analysis

In the analysis of soaps containing clay filler special care must be exercised in preparing the samples. The thinly sliced soap should be dried in an oven and then thoroughly ground to assure a homogeneous sample. The salts of the fatty acids can be extracted by 3 hours' treatment with 96 per cent alcohol and the fatty acids separated by acidification with 10 per cent sulfuric acid and ether extraction. B. Lutter and V. Tolnay, *Mezogazdasagi Kutatasok 16,* 213-19; through *Chem. Abs.*

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## Antioxidant Solubilities

Analytical procedures were devised for the determination of various phenolic antioxidants in fats, based on four colorimetric reactions.

Solubilities of antioxidants in fats were also determined. The solubilities in cottonseed oil at 30°C. were hydroquinone 5.7 mg. per gram, NDGA 7.1, gallic acid 0.16, and propyl gallate 12.3. In lard at 45°C. the solubilities were hydroquinone 5.5 mg. per gram, NDGA 5.2, gallic acid 0.16, and propyl gallate 11.4 mg. per gram. These studies showed that the antioxidants had solubilities greater than the concentrations ordinarily required to stabilize the fats.

With the aid of Lovibond colors it was shown that the more effective antioxidants led to the development of slight discoloration when exposed to air for long periods of time at 98°C. However, when 0.01 NDGA was used in lard which was stored at room temperature for 19 months in diffused daylight, there was practically no appreciable oxidation or color change. W. O. Lundberg and H. O. Halvorson. Proc. Inst. Food Tech. *1945,* 115-25.

—— • ——

## Hydrogen Peroxide Bleach

The attack on fibers at pH 7 by hydrogen peroxide can be traced to elementary oxygen. The stabilizing action of magnesium silicate is maximum at pH 7. Stabilizers are effective by precipitating traces of catalysts. Studies at different pH values lead to the conclusion that hydrogen peroxide in an alkaline medium does not attack cellulose of itself and that any decomposition of the latter is due to the action of elementary oxygen, supplied from the air or by the decomposition of hydrogen peroxide. E. Scheller. *Melliand Textilber.* **25,** 234-6.

—— • ——

## Regenerating Zeolite

A zeolite regenerating solution for use in salt brine consists of an aqueous solution of sodium bicarbonate, potassium carbonate, trisodium phosphate, sodium metaphosphate, and caustic soda. N. G. Stone and S. W. Holliday, to The Decar Chem. Products Co. Canadian Patent No. 438,476.

## Comparison of Builders

Soft water was used in an investigation comparing soda ash and some other builders in their effect on cleansing action. Besides soda ash, "Ecolit" was used as a soda-waterglass combination, and "Siliron I" as a metasilicate builder. In one series of experiments the total amount of builder to be added was introduced at once; in another series, a reduced amount was first added. This corresponds to laundry practice, when part of the alkali is reserved to be added to highly soiled laundry. In both series, the two products named were found to be superior to plain soda ash as regards washing action, effect on color, and the appearance of the washed material. The best results were obtained with the metasilicate product. Use of detergents with admixture of a wetting agent gave good results. O. Uhl. WPZ Wascherei u. Plattereiztg., *Wascherei-Beh. 1944,* 12-14; through *Chem. Abs.*

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## Watermelon Seed Oil

Watermelon seeds yield an edible oil known in Senegal as bereff or beraff oil. The oil contains linoleic acid 42.6 per cent, oleic 27.4, stearic 19.5, and palmitic 5.2 per cent. M. Carriere and A. Coulier. *Compt. rend. faculte sci. Marseille* **1,** 83-5.

—— • ——

## Grease Analysis

A modified A.S.T.M. method for the analysis of grease was investigated by Technical Committee G. Instead of being decomposed with hydrochloric acid, the grease is dissolved in inert solvents such as hot benzene and alcohol. The naphtha solution of the mineral oil, which may contain small amounts of soap, is acidified to convert any soap which may be present into fatty acids. The greases containing asphaltic or tarry materials are decomposed with hydrochloric acid instead of granular potassium bisulfate, and rinsed with small quantities of warm benzene. Data are given on cooperative tests carried out by eight laboratories for the determination of soap, free neutral fat, and mineral oil in samples of grease. G. Kaufman et al. *ASTM Bull.* No. *141,* 54-6 (1946).

# SANITARY PRODUCTS

## A SECTION OF SOAP

EVERYWHERE state legislatures are in session and the legislative pots are boiling. This is particularly true in laws designed to regulate the distribution and sale of insecticides, fungicides and disinfectants. Bills are pending in Arkansas, Iowa, North and South Dakotas, Colorado, Montana, and elsewhere. With variations in each case, these bills are essentially the same as the model act on which both most agricultural and household insecticide manufacturers and many state officials are essentially in accord. The more or less uniform proposed state laws are designed to supplement the federal insecticide bill now before Congress and follow the provisions of the latter quite closely. Although there are provisions of both the federal bill and the state acts with which some insecticide manufacturers are not in agreement, the present activity, they admit, is at least a practical beginning toward country-wide uniform legislation. Kinks and hardship will be ironed out as time goes on. But above all, the present legislative program represents progress, the first real progress toward insecticide law uniformity we have noted over the years.

ATTENTION has been called to a recent request for bids by the Veterans Administration for a considerable gallonage of insect spray. The description of the material was given "as good as the product of the So-and-So Company, or better." But it so happens that the company is a small firm doing mostly a local business and the product in question practically unknown. In fact, manufacturers desiring to bid and to obtain a sample of the named product for comparative purposes in checking the detailed specification, would undoubtedly have a tough time locating a supply of the material.

This questionable practice in calling for bids is not confined to the Veterans Administration although they are a common offender. Other government bureaus also use the same "as good as so-and-so, or better" method. And when people wishing to bid have to write to us for information about the firm or the product, we feel that this tabs the practice as slightly on the smelly side. If some specific product must be taken as an "as good or better" standard, why a remote and hardly known item? Simply because it was the last brand bought? In our opinion, this "as good or better" business could well be eliminated from all public buying, and specifications made the sole purchasing basis.

MOTH products, that is moth proofing and moth killing insecticides, are currently under the scrutiny of the Federal Trade Commission. The Commission is looking closely into advertising and label claims. That this may eventually bring fireworks in and about the household insecticide industry is not unexpected. For a considerable time past, some firms have been agitated over what they consider the too broad and questionable claims of certain competitive products. They have long held that the situation needs cleaning up. We understand that the investigation will eventually delve into the whole field of moth products, but that the first target for the FTC legal guns, if and when they are ready to shoot, has already been chosen. In the meantime, a close study of their own products and advertising by all manufacturers with a view to changes, if deemed necessary, might not be amiss. Checking one's own position before the battle starts is good tactics.

# NEW INSECT REPELLENTS

**By M. Pijoan***
University of Colorado

IN order to suppress diseases transmitted by insects, two measures received considerable impetus during the recent war. The first of these was the efficient and carefully planned application of insecticides to geographical areas and the second was the effort to induce the individual soldier to apply repellent chemicals to himself for his own immediate personal protection. In both these instances, the war stimulated research programs which were coordinated through the National Research Council, its collaborating war agencies, the U. S. Department of Agriculture and the Army and Naval Units. Significant in the program were the Universities who through the Office of Scientific Research and Development contributed a large share of material and thought.

With reference to insect repellents, a voluminous literature exists, but it is only within recent years that the subject has assumed clarity and scope with reference to molecular structure and insectifugal action. The precise mechanism in this cause and effect relationship is not known and the physiological studies to date are not particularly suited for drawing warranted conclusions. Regardless of the lack of explanation, certain chemicals do exert insectifugal action and in some instances related compounds may show this value yielding a common denominator of configuration and the position of a functioning group. The occasional single chemical having such insect repellent activity may be a fortuitous individual often responsible for synthesis of a large series of compounds or derivatives devoid of any insectifugal power. Thus dimethyl phthalate being a repellent led to the presumption that a repellent action for dibutyl phthalate existed, a property not found, however, in the latter or in other compounds of this series.

Modern studies on insect repellents began with the work of Grannett and his associates (1). Beginning in 1935, under a research fellowship sponsored by The National Carbon Company, they eventually set forth the basic criteria for an ideal repellent. Regardless of their changes in methods of testing, etc., the work pointed to the essential goal of a repellent. This goal is dependent on the following criteria – (a) that the material should be cosmetically acceptable, (b) that it should be effective for several hours and (c) that it should be relatively non-toxic when applied to the skin. Their first investigations resulted in a mixture of diethylene glycol monobutyl ether acetate and diethylene monoethyl ether. (2) This product, known as "Sta-Way," was found to be markedly superior to oil of citronella and other contemporary chemicals against *Aedes-solicitous* and *Aedes cantator*. However, Granett was still not satisfied. There were objections to "Sta-Way" and research continued, culminating in 1942 with the synthesis of 2 ethyl hexanediol by B. G. Wilkes (3). What is of interest in this work is the establishment of chemical relationships. Noting the presence of a diethylene glycol in "Sta-Way," the saturated 1,2-diols and 1,3 diols may be regarded as substitution products of ethylene glycol and trimethylene glycol. One or more of the hydrogen atoms attached to the carbon atoms are replaced by a corresponding number of hydrocarbon radicals. From this series all 1,2 and 1,3 diols exhibited insect repellent action: 2-ethyl hexanediol -1,3; 3,5- dimethyl hexanediol, 2,3; 6 methylheptanediol 2,4; 3 methyloctanediol -2,3 etc.

Of the series, 2 ethyl hexanediol-1,3, offered high repellent activity in temperate climates against mosquitoes, fleas, and chiggers (5). At Rutgers University, under environmental conditions prevailing at 75° and 50-60° relative humidity, protection against *Aedes aegypti* was obtained for 536 minutes as compared to dimethyl phthalate at 455 minutes. Against anophelines the new repellent (Rutgers 612) was generally not as effective as dimethyl phthalate. Against most other insects it was generally superior (with the exception of certain flies where indalone was more effective) (4). But progress had been made since this repellent was most satisfactory from many points of view.

In 1942 the armed forces expressed a need for an all-purpose repellent against insects. All three of the above repellents were mixed and also used separately. It was argued, however, that mixtures of the three would afford a more complete protection. There appeared to be no other recourse and time and materials were of the urgency. In 1943 and 1944 reports received by the Navy and Army revealed that the mixture was not all that was hoped for in tropical areas. The effect of hot humid heat had not been precisely known. Another objection was the odor and viscosity of the mixture. But the most difficult problem presenting itself was that protection was reduced: each ingredient served to dilute the other and the failure of the fighting men to reapply sufficiently often was one of the causes of its relative inefficiency.

Dr. Mathieson and his entomological associate, Dr. Charles Wilson, reporting to the Navy early in 1944 (5) stated that "even though 2 ethyl hexanediol 1,3, dimethyl phthalate and

* Before Nat'l. Assn. Insecticide & Disinfectant Mfrs., New York, Dec. 4, 1946.

**Research on insect repellents, stimulated by the war, has developed several promising new materials, but as yet not the ideal repellent. Repellent effectiveness still varies sharply with environmental changes.**

indalone were officially adopted, their disadvantages were fully recognized. They were readily removed by rubbing, sweating, and by rain. It is believed that these repellents could be made to adhere to the skin . . . the duration of their effectiveness would be increased." However, as they reported further, mixtures containing repellent, shellac and fillers were found objectionable, even though the repellent effectiveness was increased. The pastes were difficult to remove and were cosmetically unacceptable.

No criticism should be levelled against the repellents mentioned especially the long chain diol series, the latter especially in view of its satisfactory performance as an all around repellent for general use. What was now needed was a single repellent unit effective in the tropics against a variety of insects but with particular emphasis on disease vectors.

THE search for a more nearly perfect repellent has followed two lines of endeavor: (a) to find new repellent chemicals and (b) to prolong the effectiveness of the adopted ones by incorporating them in a wide variety of bases. This process involved a systematic screening procedure of new compounds by the United States Department of Agriculture at Orlando, Florida, and the testing of repellents in various vehicles. The program was organized so that several thousand compounds and their derivatives could be rapidly tested and the results summarized by the Insect Control Committee of the National Research Council. This process made current data available to those working on repellents for military use.

The problem of the study of insect repellents is a complex one and only recently have certain criteria been established for critical evaluation. Briefly, these are as follows: (a) the tests, for proper chemical evaluation, must be carried out under constant environmental conditions, preferably those simulating hot tropics, (b) the volunteers making the tests must remain within such an environment at all times since changes in environment tend to prolong the effectiveness of repellents, and (c) the repellents must be tested for toxicity by the Food and Drug Administration of the United States Department of Agriculture. The synthesis of new repellents must entail a correlation of structure with their effectiveness, and synergistic interaction between repellent and solvent must be sought for. Considerable data have been presented in reports to the Bureau of Medicine and Surgery of the Navy Department (6,7). Since security classification on these studies has now been removed, three phases of the repellent investigation will be presented briefly.

It was noted that the protection periods (activity) afforded by mosquito repellents when applied to the skin under simulated tropical conditions (90° F. dry bulb, 80° F. wet bulb) were decreased as compared to the action of a repellent used in more moderate conditions (80° F. dry bulb, 70° F. wet bulb). Thus against *Aedes aegypti* (of known density and fixed biting rates) the action of dimethyl phthalate (high protection stock) and NMRI-201 had the repellent activity shown in table 1.

Dry heat (90° F. dry bulb, 70° wet bulb) produced the most significant decrease in repellent effectiveness (from average of 267 minutes to average of 99 minutes with dimethyl phthalate and from average of 285 minutes to average of 187 minutes with NMRI-201). With the same dry-bulb temperature (90° F.) increasing the humidity (wet bulb 80° F.) produced only a slight additional decrease in repellence. It is presumed that the effects of increasing the humidity were due to the dilution of the repellents by sweat.

Sweat was collected in rubber gloves from men running on a treadmill under hot environmental conditions. The repellents were diluted with sweat and the mixture tested in environments of 80° F. dry bulb, and 70° F. wet bulb. The effect of sweat in itself on dimethyl phthalate, Rutgers 612 and NMRI-201 was to reduce the repellent activity but not as much as was then presumed by dilution. In fact, sweat had a somewhat synergistic effect if the reduction of the repellent activity is not commensurate with the dilution. It will thus appear that the effects of high humidity and sweat form a combination of factors which results in dilution and possibly increasing absorption of the repellent through the skin, evaporation, etc.

It is apparent to us that fixed environmental conditions are necessary for the evaluation of a repellent and the data secured by such a method are necessary for precise evaluation.

The early tests also indicated that certain standard commercial repellents could have their protection period enhanced by the addition of relatively non-repellent solvents. Thus

**TABLE 1.—Effect of Environmental heat on the mosquito repellent activity of Dimethyl phthalate and NMRI-201 against *Aedes Aegypti***

| REPELLENT | Subject | Arm | Dry Bulb: / Wet Bulb: | Time to first bite (minutes) Tests without Exericse 80°F. / 70°F. | 90°F. / 70°F. | Tests with Exercise 90°F. / 80°F. | 90°F. / 80°F. |
|---|---|---|---|---|---|---|---|
| DIMET- | F | R | | 266 (D) * | 91 (D) | 65 (VS) | 56 (PS) |
| | | L | | 261 (D) | 81 (D) | 66 (VS) | 54 (PS) |
| HYL P | G | R | | 269 (D) | 97 (D) | 67 (VS) | 53 (PS) |
| | | L | | 265 (D) | 80 (D) | 65 (VS) | 61 (PS) |
| HTHAL | P | R | | 272 (D) | 118 (D) | 116 (D) | 58 (PS) |
| | | L | | 271 (D) | 124 (D) | 127 (D) | 62 (PS) |
| ATE | Range | | | 265-272 | 80-124 | 65-127 | 53-62 |
| | Average | | | 267 | 99 | 84 | 57 |
| NN | F | R | | 285** | 188** | 142** | 165** |
| | | L | | 289 | 185 | 155 | 178 |
| MRI | G | R | | 282 | 182 | 161 | 166 |
| | | L | | 277 | 179 | 146 | 176 |
| 201 | P | R | | 286 | 198 | 148 | 151 |
| | | L | | 289 | 192 | 169 | 157 |
| | Range | | | 277-289 | 179-198 | 142-169 | 151-178 |
| | Average | | | 285 | 187 | 154 | 166 |

* Skin condition at time of experiment:
D = dry skin
VS = visible sweat
PS = pooled sweat
** = same skin conditions as those of dimethyl phthalate

when one of these repellents was mixed with benzyl alcohol, the following results as shown in table 2 were obtained:

Results were obtained with other solvents and the effect of these solvents was either to increase the effectiveness (synergism) or to decrease the effectiveness (antagonism). Considerable importance has been given to this phenomenon even though the explanation for the final result is not known.

Early research on our part with repellents was most baffling. Inconsistent results, disagreement among entomologists, adoption of testing procedures, the subject matter itself all blended to produce confusion. Many laboratories were synthesizing compounds at random, materials were being tested regardless of the chemistry involved. But in all of the situations the most discouraging feature was the lack of a precise figure or time interval of repellent protection. There was too much variation for critical evaluation.

It became necessary to build testing chambers at fixed environmental conditions with constant wet and dry bulb temperatures. For this purpose an environment simulating tropical heat was used, namely 90° F. dry bulb and 80° F. wet bulb. It was further found that to Grannett's original criteria were to be added (a) ease of application (b) repellency to mosquitoes for a minimum of six hours under tropical conditions and (c) that the repellent should be a liquid since this was preferred by the armed forces. With this in mind and having abandoned special pastes and plastic vehicles incorporated as mixtures to prolong repellent efficacy, a new search for insectifugal chemicals was inaugurated.

**TABLE 2.—The effect of a benzyl alcohol in the repellent action of a hexanediol.**

| *Repellent* | *Benzyl alcohol (parts)* | *Duration of repellent (minutes)* | *Synergic Index T mixture* / *Tsol.f Tsolv. (1-f)* | *Repellent Index Tmix.* / *Tsolute* |
|---|---|---|---|---|
| 1.0 | 0.0 | 95 | 1.0 | 1.0 |
| 0.8 | 0.2 | 251 | 3.03 | 2.64 |
| 0.6 | 0.4 | 112 | 1.60 | 1.19 |
| 0.4 | 0.6 | 83 | 1.50 | 0.87 |
| 0.2 | 0.8 | 52 | 1.20 | 0.55 |
| 0.0 | 1.0 | 30 | 1.0 | 0.31 |

BASED on results obtained by the Department of Agriculture at Orlando, there appeared to be promise with a compound synthesized by Dr. P. D. Bartlett (Harvard University). This compound 1,2,3,4, tetrahydro beta naphthol (8) gave a protection period of 197 minutes against *Aedes egypti* at 90° F. dry bulb at 80° F. wet bulb.

None of the standard adopted repellents had exceeded 100 minutes at this temperature, (it is important to mention that fixed testing rates ranging between 10-30 per 30 seconds from some 2,000 mosquitoes per sq. meter were maintained). With this in mind a series of naphthalene derivatives was synthesized and subjected to test. Like the diols synthesized by Wilkes, all of the naphthols studied exhibited repellent action. (Table 3.)

But it must be noted that these substances although possessing repellent action are by no means ideal repellents. First many of them are irri-

tating to the skin on repeated applications and secondly many undergo oxidative changes with the formation of hydroperoxides (9).

It was noticed, for instance, in 201 that on standing the material developed a deep red to black color and as the chromogen increased there was a concomitant decrease in repellent activity and an increase in toxicity. Detailed studies revealed that this was due to hydro peroxide formation; the effects of hydroquinones etc. being only temporary and related to their end consumption of oxygen. Although 201 proved satisfactory in the tropics, lasting usually for from 5-6 hours or more against all insects (with the exception of the Simulium fly), it was felt that the toxicity did not warrant general use especially when the material became cosmetically unacceptable.

Since beta tetralol exhibited such a degree of change as an ingredient in 201, alpha tetralol was substituted and in fact this proved fairly effective. A gradual color change, even though slight, occurred and it was felt that under certain circumstances it, too, might develop considerable change in color. Other naphthols, proving satisfactory, were too expensive to recommend for general manufacture.

While these problems were being considered, we undertook the synthesis of fifteen derivatives of the analogue of 2 naphthol (or for ideal comparison 2 hydroxy naphthalene), namely 2 hydroxy diphenyl (10). What appeared to be important in this series, as was the case with naphthalene, was that hydrogenation was necessary towards increasing insectifugal action and decreasing toxicity towards mammalian skin tissue.

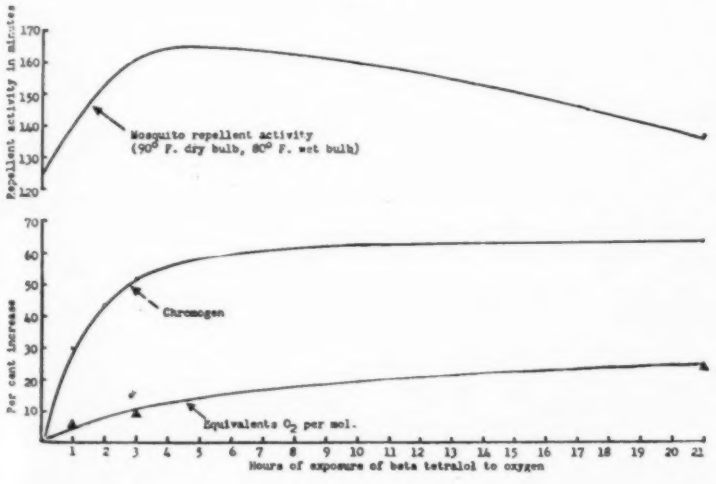
**TABLE 3.—Final selection of compounds which repel Aedes Aegypti for longer than 120 minutes at environmental temperature of 90° F. dry bulb.**

| *Number* | *Repellent chemicals* | *Number of Tests* | *Average time to first bite (mins.)* |
|---|---|---|---|
| 458 | 2-naphthol, 1,2,3,4-tetrahydro, 1-methyl | 3 | 259 |
| 431 | 2-phenyl cyclohexanol, purified | 5 | 239 |
| 459 | di-(2-naphthol, 1,2,3,4-tetrahydro, 1-ethyl | 3 | 230 |
| 402 | di-(2-naphthol, 1,2,3,4-tetrahydro) ester of oxalic acid | 3 | 226 |
| 412 | a mixture of 2-naphthol, 1,2,3,4-tetrahydro acetyl glycerine ester (120°-139°C.; 15 mm.) and dihydronaphthalenes (120°-139°C.; 15 mm) | 7 | 223 |
| 460 | 2-naphthol, 1,2,3,4-tetrahydro, 1-methyl, acetate | 3 | 219 |
| 436 | 2-naphthol, 1,2,3,4-tetrahydro, 1-methoxy | 5 | 215 |
| 462 | 2-naphthol, 1,2,3,4-tetrahydro, monochloro | 4 | 201 |
| 421 | 1-naphthol, decahydro (cis) (100°-110°C., 16 mm) | 3 | 198 |
| 432 | 2-naphthol, 1,2,3,4-tetrahydro (purified) | 3 | 197 |
| 403 | 2-naphthol, 1,2,3,4-tetrahydro glycollic ether (136°-140°C., 14 mm) | 3 | 186 |
| 420 | 2-phenyl cyclohexanol acetyl glycine ester | 4 | 186 |
| 461 | 2-naphthol, 1,2,3,4-tetrahydro, 8-mononitro, acetate | 4 | 178 |
| 441 | 2-naphthol, 1,2,3,4-tetrahydro propionate | 6 | 176 |

**TABLE 4.—Incidence of skin irritation by the repellent 201.**

| *Location of tests* | *Number of subjects* | *None* | *Tingling sensation* | *Warm sensation* | *Ery thema* |
|---|---|---|---|---|---|
| NMRI | 10 | 8 | 1 | 1 | 0 |
| Palmar, Costa Rica | 2 | 1 | 0 | 0 | 1 |
| Manila, Costa Rica | 25 | 23 | 1 | 1 | 0 |
| Good Hope, Costa Rica | 1 | 0 | 1 | 0 | 0 |
| Almirante, Panama | 13 | 13 | 0 | 0 | 0 |
| Georgia | 1 | 1 | 0 | 0 | 0 |
| San Juan del Gozo, El Salvador | 4 | 4 | 0 | 0 | 0 |
| Jaltepec Island, El Salvador | 2 | 2 | 0 | 0 | 0 |
| Managua, Nicaragua | 1 | 1 | 0 | 0 | 0 |

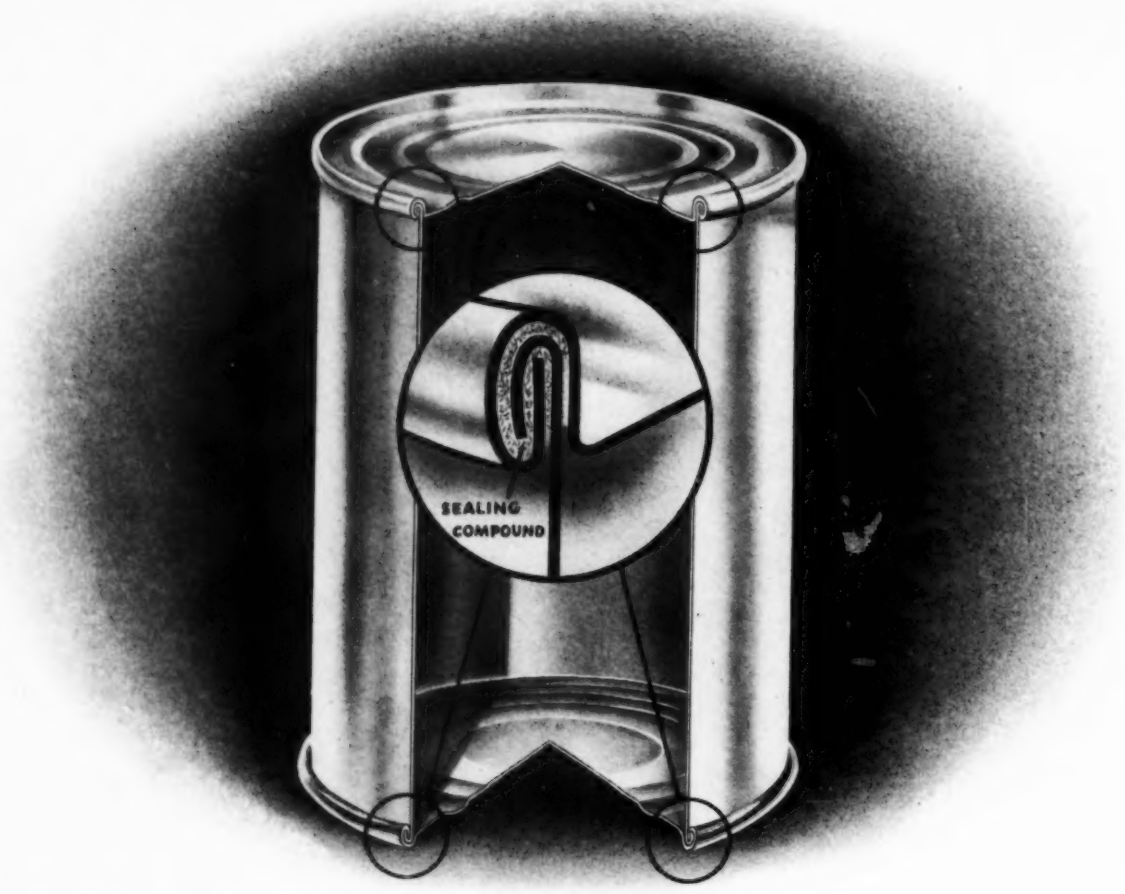
CHART I


Repellent activity in minutes
Mosquito repellent activity (90° F. dry bulb, 80° F. wet bulb)
Per cent increase
Chromogen
Equivalents $O_2$ per mol.
Hours of exposure of beta tetralol to oxygen

For the purpose of brevity, 2 phenyl cyclohexanol, well known to chemists for sometime and having received consideration as a possible insecticide and repellent for some twenty years was found as in 201, to have synergistic interaction with other hydrogenated diphenyls, the most economic mixture being with the continued hydrogenation product 2 cyclohexyl cyclohexanol. A single step hydrogenation procedure was devised to bring about a yield from one hydrogenation (henceforth we shall refer to this as the Dow Process). It is to be noted that in many instances synergism cannot be determined except under fixed environmental conditions. Effectiveness based on statistical evidence then can be obtained from field trials.

At any rate the combination in defined proportion of the 2 hydrogenated diphenyl derivatives formed the basis for 448. It was felt that since

(*Turn to Page* 173)

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# *Postwar Problems in Testing* DISINFECTANTS

**By L. S. Stuart***
Production and Marketing Administration, U.S.D.A.

WITH the conclusion of the war and the release for civilian use of the new germicidal chemicals developed in connection with the war effort, the always perplexing problem of disinfectant testing has been complicated further.

From the viewpoint of regulatory control, the problem has been aggravated by the rush of both the old-established and new manufacturers to place these products on the market either as new items or by including them as new ingredients in old formulas. Many of these new substances and renovated formulas give surprisingly high inconsistent results when tested by established official methods. These results, it is claimed, frequently indicate merits far beyond those which the products actually possess. Thus, the established official methods for testing have been and are at the present time the object of much adverse criticism.

The existing official methods can be changed to meet the situation that has developed, but the process of change must be orderly. Above all, such a change must give adequate protection to the public and be fair to both the new products and the old-established products that compete in the open market. Fair to the old products, inasmuch as we know from experience how reliable they can be; and fair to the new since the lifeblood of the disinfectant industry—like that of all industry—is the development of new, more versatile products.

Recently it has been suggested that the use of phenol coefficient expressions be prohibited in connection with quaternary ammonium germicides. There are many reasons why this would appear to be a logical and desirable step to take. However, we must inquire into both the justice and the practicality of a prohibition directed against a product marketed directly for a specific use unless such restriction is also enforced when that product is marketed indirectly for the same use. It would seem neither fair nor practical to prohibit the use of the phenol coefficient expression to a

* Before the National Association of Insecticide and Disinfectant Manufacturers, Inc., New York, December 3, 1946.

TABLE 1. RESULTS OBTAINED IN OFFICIAL F.D.A. PHENOL COEFFICIENT METHOD WITH QUATERNARY AMMONIUM GERMICIDE III WHEN DILUTED AT VARIOUS pH LEVELS WITH M/15 PHOSPHATE BUFFER.

| | pH | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 5.47 | | | 6.05 | | | 6.44 | | | 7.03 | | | 7.60 | | |
| | TIME INTERVALS IN MINUTES | | | | | | | | | | | | | | |
| | 5 | 10 | 15 | 5 | 10 | 15 | 5 | 10 | 15 | 5 | 10 | 15 | 5 | 10 | 15 |
| DILUTION | | | | | | | | | | | | | | | |
| 1-8000 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| 1-10000 | + | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| 1-12000 | + | + | — | + | — | — | + | — | — | — | — | — | + | — | — |
| 1-14000 | + | + | — | + | + | — | + | — | — | — | — | — | + | + | + |
| 1-15000 | + | + | — | + | + | — | + | — | — | — | — | — | + | + | + |
| 1-16000 | + | + | + | + | + | — | + | + | — | + | — | — | + | + | + |
| 1-18000 | + | + | + | + | + | — | + | + | — | + | — | — | + | + | + |
| 1-20000 | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| 1-22000 | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| APPARENT* PHENOL COEFFICIENT | 10000=111.1 / 90 | | | 12000=133.3 / 90 | | | 15000=166.7 / 90 | | | 18000=200.0 / 90 | | | 12000=133.3 / 90 | | |

*Calculated from the resistance of the *E. typhosa* culture used as determined by distilled water dilutions.

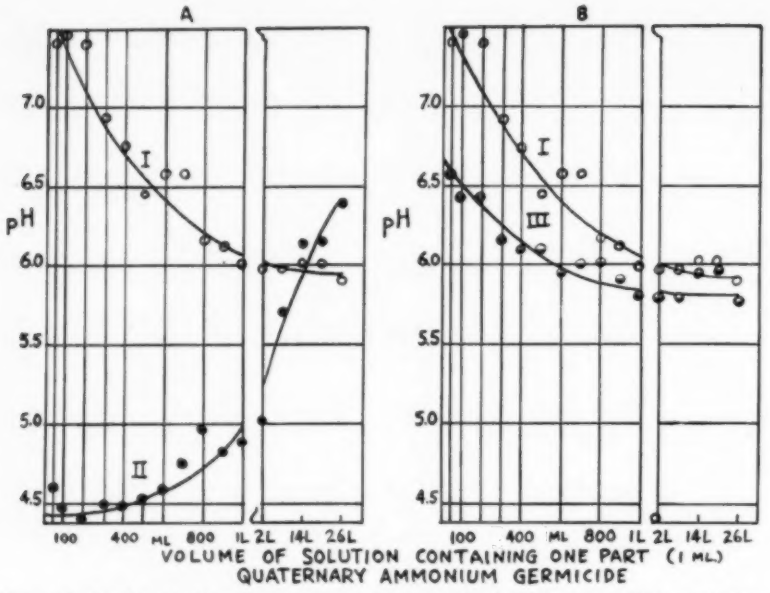


**Figure 1. Results of pH measurements on freshly made distilled water dilutions of three quaternary ammonium germicides.**

manufacturer of quaternary ammonium compounds while allowing manufacturers of proprietary brand disinfectants to use quaternary ammonium compounds to boost the coefficient values of their products.

Many truly valuable suggestions have been given relative to possible modifications that could be made in the actual testing procedures that would give results more truly representative of the activity of quaternary ammonium compounds. Studies conducted in the Department laboratories have already provided data which clarify, in part, the problem of securing uniform results with these germicides.

For example, it has been found that not all disinfectants sold as quaternary ammonium germicides appear to hydrolize in the same manner upon dilution with water. In Figure 1A the pH values obtained on freshly prepared distilled water dilutions of quaternary ammonium germicides I and II are plotted. Germicide I seems to hydrolize in general after the pattern usually associated with salts of weak bases and strong acids, whereas germicide II behaves more like the salt of a strong base and a weak acid. Such results illustrate the heterogeneous character of the quaternary ammonium germicides as a group. In Figure 1B the pH values obtained on freshly prepared distilled water dilutions of two preparations of the same quaternary ammonium germicide but of different manufacture are plotted. From this figure, it can be seen that germicide I and germicide III ionize at quite different levels when diluted with distilled water. Thus, it appears that appreciable variations occur between different preparations of the same quaternary ammonium compound and this emphasizes further the variable physiochemical nature of these materials.

In Figure I the pH curves for the three quaternary ammonium germicides studied have been depicted as smooth curves, although, it is apparent from the actual points indicated on this figure that the curves are actually not uniform. In Figure 2A (distilled water dilution)—pH curves have been plotted for two of these compounds where the actual points determined have been connected with straight lines. It can be seen that with both germicides I and IV the pH values found between dilutions of 1-1000 and 1-30000 produce very erratic curves. This probably indicates that we are dealing with the influence of hydrolysis on molecular associations, as well as with direct ionization; this emphasizes the difficulty of preparing a series of dilutions which will behave uniformly as to germicidal activity. The variations shown in Figure 2A, while fairly large, seem insignificant when compared with those shown in Figure 2B. Here the pH values found for dilutions of germicide I after 1 hour, 5 hours, and 72 hours at room temperature are plotted. It can be seen that within 5 hours the entire pH level for this series of dilutions has shifted upwards by about 1.5 pH units and that even after 72 hours there is no stabilization at any common pH level. Inasmuch as the 1-to 5-hour period is the time usually employed in running germicidal tests, it would appear that variations over this time interval might be the cause of some of the inconsistencies encountered with these products.

A concrete illustration relative to the magnitude of such possible variations is given in Table I. Here, results obtained with germicide III buffered at pH levels ranging from 5.47 to 7.6 in germicidal tests using the official FDA phenol coefficient procedure are given. With this particular quaternary ammonium compound the critical 10-minute killing dilution varies from 1-10,000 at pH 5.47 to 1-18,000 at pH 7.03.

FROM such results, it appears that the problem of securing consistent results with these compounds might be in a large part solved through the development of a standard procedure for preparing the test dilutions, and research is being continued along this line.

In an effort to speed up the accumulation of data on the problem outlined above, and on such factors as variation in the test culture medium, the influence of carriers for the test organisms—and methods for eliminating bacteriostatic effects — cooperative studies have recently been initiated with the Scientific Committee on Disinfectant Testing of the National Association of Insecticide and Disinfectant Manufacturers, Inc. It is too early to make a report on data obtained in these studies. In these studies, 15 N.A.I.D.M. member laboratories have accepted assignments, and with the completion of this work it may be possible to draw some definite conclusions on testing procedures.

There is some reason to doubt, whether changes of this type can solve

our problem in its entirety. Even as a sprinter's time is measured in seconds, the age of a person in years, and the distances between planets in light-years, so we have accepted phenol coefficient values as originally suggested by Rideal and Walker as units in our official scale for measuring disinfectant activity.

Inasmuch as phenol coefficient methods are the only methods which embody the essential concept of a selected test organism standardized against a pure germicidal chemical of known concentration they are basically the only methods, so far proposed, through which direct comparisons of different compounds, mixed compounds and mixtures of unknown composition can be made. If comparisons made on this basis are found not to be valid, then an effort should be made to determine all points at which our present phenol coefficient procedure may be inadequate before abandoning it.

It can be stated that any satisfactory standard test must not only contain an adequate procedure for conducting trials but also an appropriate method for calculating and reporting the results. Thus, while examining the adequacy of our trial procedures, we should at the same time examine our present method of calculating and reporting the results obtained. We must determine if present phenol coefficient values constitute a scale that represents a judicious choice in units for correctly evaluating relative germicidal strength.

THE present method of calculation is based on the assumption that there is a true inverse straight line relation between germicidal strength and chemical concentration. It has been known for some time that this assumption is not true and that the actual relation between germicidal activity and chemical concentration is most probably of an exponential nature. No change has been made in our official procedure acknowledging this apparent fact inasmuch as no universal mathematical relationship between concentration and germicidal strength has been developed. This—combined with the fact that products possessing

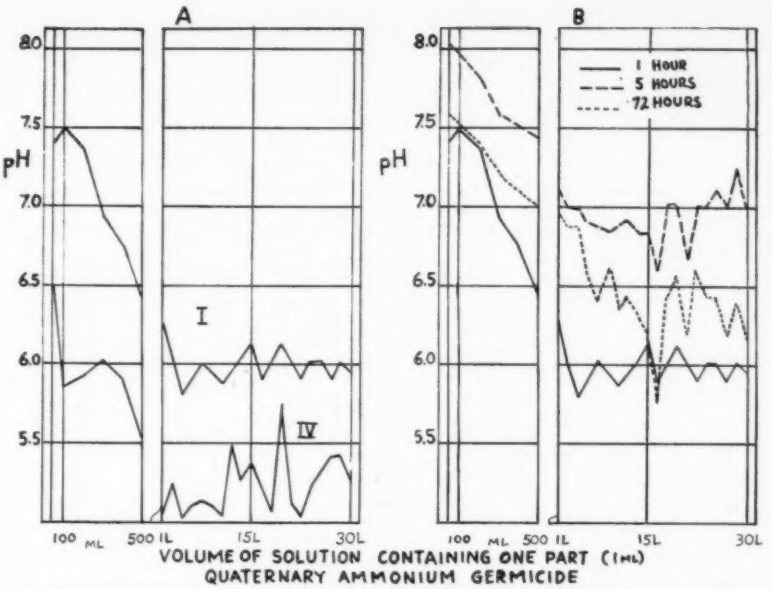


**Figure 2. Results of pH measurements on distilled water dilutions of quaternary ammonium germicides when freshly made and after standing for 5 and 72 hours.**

coefficient values over the range normally encountered with the old-established germicidal chemicals were found in extensive practical tests to give efficient disinfection when diluted according to the constant factor of 20 times the phenol coefficient found—made a change of this type appear unnecessary. In other words, ability to apply a constant conversion factor in the transposition of phenol coefficient results obtained in the laboratory to safe-use dilutions for general disinfection, suggested strongly that any error growing out of the assumed true inverse relation was with that part of the scale of immediate concern small enough to be disregarded.

With the development of new germicides active in very high dilutions or possessing high coefficient values, it may become necessary to change our methods for calculating and expressing the phenol coefficient. Before such a change can be made, a definite relation must be established between chemical concentration and germicidal strength. Even though a true universal relation does not exist, it may be found that an arbitrarily derived relation can be shown by experimental data to be more useful for comparison purposes over a wider range of chemical concentrations than is the assumed straight line relation which is now a part of our official procedure.

The present phenol coefficient values are derived on the basis of a constant 10-minute killing time. There has been considerable agitation to shorten this time interval or provide for official time kills of 1 or 2 minutes, in addition to the 10-minute kill interval. There is no quarrel with the contention that disinfectants which kill in very short intervals of time possess merits for particular uses over slow-killing disinfectants. On the other hand, a careful study of all existing killing-time temperature curves found in the literature, makes it apparent that a complete killing-time method based on any time interval of less than 10 minutes might be subject to grave inaccuracies. All such curves tend to become asymptotic as they approach zero and because of this it is difficult indeed to establish within very narrow limits the exact time of complete kill when the time interval is shorter than 10 minutes.

No survey of present day problems involved in disinfectant standardization would be complete without reference to the frequently suggested procedure of standardization by a method based on a partial kill of the number of organisms initially present. Although methods of this type are ideally adapted to statistical and mathematical interpretation, they possess certain in-

*(Turn to Page 147)*

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# STOVE POLISHES

By

Robert L. Stetson

MOST people associate stove polish with rural areas where so called modern comforts are still on their way. Nonetheless, one can walk into any big "five-and dime" store on New York City's busy Forty-Second Street and buy a bottle or can of stove blacking made with graphite.

Although there are not as many as in the days before central heating and piped or bottled gas, there must be literally millions of cast iron stoves, oil heaters and gas ranges still in use in the United States. While a large proportion is undoubtedly to be found in the more thinly populated sections, many such heating and cooking devices are doing excellent jobs in urban and suburban homes. These, as well as many of the furnaces which have replaced them, require periodic polishing, not so much to improve appearances as to prevent rusting and corrosion. Parts directly exposed to flame and heat are particularly prone to corrosion, and the application of an opaque, heat resistant film of graphite is an effective means for combating this undesired action.

Those who assume that stove polishes are rather old-fashioned products, limited to use on stoves and furnaces, may be surprised to learn that such preparations served a very important function during the war in the protection of airplane engines. Hall (1) cites the fact that "vast" quantities of stove polish were used by ground crews of the several air forces to protect from corrosion the various iron and steel engine parts which are subject to high temperatures. Undoubtedly other, similarly important uses for stove polishes could be cited.

After application as a thin coating to the well cleaned, grease-free iron surface, the polish should be rubbed briskly and thoroughly, preferably with a dry brush, to give an opaque, resistant finish. If properly applied, such a film should not rub off or soil cooking utensils. Although most polishes can be used on cold surfaces, with many products best results are obtained when the blacking is applied on a warm or even hot surfaces. Obviously, stove polishes containing inflammable ingredients must be used with great caution, if at all, on heated parts.

Stove polishes are provided in four general types; as liquids, pastes, cakes or sticks, and as powders. According to the Federal Specifications (2) covering such products, stove polishes must produce a deep, lustrous black color when applied as directed. All four types must be noninflammable, should not produce any odors, and must provide a durable coating that will not readily be burned off. It is specified that liquid stove polish shall be of such consistency that the addition of a fluid will not be necessary to make it free-flowing. Paste polish must be of such consistency that it can be readily applied. Stove polish in cake form should disintegrate readily in water to form a paste, and the powder type polish must also mix readily with water to form a paste. Some stove polishes on the market do not meet these requirements, especially with regard to noninflammability and the production of odors after application.

Graphite is the basic ingredient of practically all stove polishes or blackings. Natural graphite, sometimes known as "plumbago" or "black lead," is a mineral mined in a number of places throughout the world. The natural material has long been used as a polish and coating for iron articles in the process known as "black-leading." (3) The quality of the graphite varies somewhat according to the source. After mining, the mineral is refined to obtain a maximum carbon content, and smallest particle size. The manufacturer of stove polish should consult producers of graphite to ascertain the quality or grade best suited to his polish product.

Artificial graphite, made in an electrothermal furnace with direct heating, may also be used to make stove polishes. Artificial only in the

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sense that it is manufactured, it is purer and more uniform than the natural product. (4)

As pointed out by Mason, (5) graphite possesses the peculiar quality of adhering tenaciously to smooth surfaces. This may be attributed to the shape and nature of the particles, which are plates of an oily nature. Rubbing under pressure distributes and flattens them into a film. The film is eventually burned off or lost by abrasion, but the graphite particles do provide considerable protection for a good length of time.

Lampblack, carbon black, and bone black are sometimes included to deepen the color of the polish, but these forms of carbon are more easily burned off than graphite. On occasion nigrosine dye is added to deepen the color of these products. (6, 7)

In addition to these materials, stove polishes may contain such ingredients as soap, sodium silicate solution, waxes, gums, sugar, glycerine, water, oils, turpentine, solvents and other substances. A suspending agent or binder is usually required in the production of liquid and paste type polishes and in some cake type products. Soap may be used for such purposes. Rosin soaps, generally formed *in situ* during the mixing of the ingredients, are often recommended in standard procedures. That formulation of stove polishes is not entirely based on old-fashioned methods is indicated by the use of modern emulsifying or suspending agents like diglycol stearate.

Sodium silicate solution, used alone or in conjunction with other agents, is often employed as a suspending or pasting medium for making stove polishes. Various natural resins, gums and a number of waxes are also used for thickening the products; the waxes often being used in polishes containing various solvents. Turpentine is the solvent most commonly employed, but naphtha is often used. Carbon tetrachloride is sometimes included in the solvent mixture to reduce inflammability.

As already indicated in the Federal Specifications, the manufacture of inflammable polishes is not looked upon with favor. Some authorities (8) refuse to describe the production of such items, while others (9) condemn them entirely. Of course, all products presenting fire hazards must carry an appropriate warning label.

LIQUID polishes may consist of suspensions of graphite, with or without other carbon pigments, in water or in suitable organic liquids, plus adjunct suspending agents or polishing aids. Illustrative of the preparation of a noninflammable product, in which both soap and sodium silicate solution serve as the suspending agents, is Belanger's (10) well-rounded formula for a liquid stove polish:

| | |
|---|---|
| Oleic acid | 1 gal. |
| Stearic acid | 1 lb. |
| Graphite (Dixon's No. 2) | 22 lb. |
| Water | 11 gal. |
| Soap chips | 2 lb. |
| Carbon black | 11 lb. |
| Glucose | 1 lb. |
| Sodium silicate solution (water glass) | ½ gal. |

Mix the oleic and stearic acids with 5 gallons of water and heat until melted, then stir in the glucose. In a separate vessel dissolve the soap in the rest of the water, bring to a boil and sift in the graphite and carbon black. Continue boiling, with stirring, for about 10 minutes and slowly add the first mixture. Remove from heat and continue stirring until nearly cold, then fill into containers while maintaining agitation. The product should be well shaken before use.

Waxes are sometimes included in aqueous vehicles to impart added polishing properties. In the following stove polish, (11) a rosin soap is formed to aid emulsification of the waxes and retard settling of the graphite and pigment:

| | *Parts* |
|---|---|
| Rosin | 1 |
| Montan wax, crude | 2 |
| Carnauba wax | 2 |
| Caustic potash | 2 |
| Water | 85 |
| Nigrosine | 3 |
| Graphite, flake | 5 |
| Lampblack | 3 |

Carefully melt the rosins and the waxes. Separately, the potash and nigrosine are dissolved in the water and gradually stirred into the wax-rosin mixture at about 90°C. Agitate thoroughly during cooling, when the graphite and lampblack are uniformly incorporated.

Liquid stove polishes may also be made by suspending graphite in a petroleum distillate mixture or other solvents. Obviously such products are inflammable. The addition of enough carbon tetrachloride will render the mixture noninflammable, (7, 8) but such polishes must be used with adequate ventilation. However, it is common practice to include rosin or waxes in these products to improve suspending and polishing properties. For example, one fairly simple stove polish may be prepared from: (12, 13)

| | |
|---|---|
| Graphite, fine powder | 1 lb. |
| Lampblack | 1 oz. |
| Rosin | 4 oz. |
| Turpentine | 1 gal. |

Equally simple, but perhaps somewhat more modern, is a product consisting of: (11)

| | *Parts* |
|---|---|
| Graphite, colloidal | 20 |
| Paraffin wax | 13 |
| White spirits | 67 |

The consistency of this polish can be regulated by the amount of solvent used.

A much more elaborate preparation, listed by Mason, (5) calls for the use of:

| | *Parts* |
|---|---|
| Asphalt (by-product) | 11 |
| Asphalt (gilsonite) | 6 |
| Paraffin | 10 |
| Naphtha | 25 |
| Graphite | 20 |
| Carbon tetrachloride | 25 |
| Nigrosine, oil-soluble | 3 |

Emulsion type liquid stove polishes take advantage of the characteristics inherent in both aqueous and solvent type products. Like all emulsion preparations, however, their production requires a certain amount of skill and "know-how." In the following semi-liquid stove polish, soap serves as the emulsifying agent: (11)

| | *Parts* |
|---|---|
| Nigrosine, water-soluble | 1 |
| Hard soap | 3 |
| Water | 32 |
| Paraffin wax | 3 |
| Ozokerite | 1 |
| Nigrosine, oil-soluble | 1 |
| Turpentine | 20 |
| Graphite | 39 |

Melt the waxes with the oil-soluble nigrosine, thin with the turpentine and make a paste with the graphite. Separately dissolve the soap and water-soluble dye in the water by boiling, and to this add the wax-graphite mixture with good stirring.

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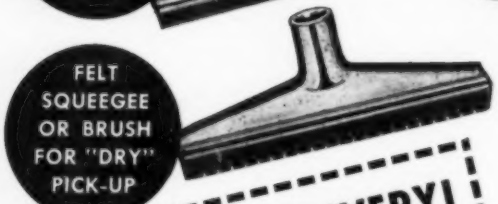


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An emulsion of montan wax and naphtha in water, with a rosin soap formed *in situ* as the emulsifier, forms the vehicle for the following liquid polish: (5)

| | Parts |
|---|---|
| Rosin | 7 |
| Montan wax, crude | 2 |
| Naphtha | 2 |
| Caustic soda | 1 |
| Water | 70 |
| Nigrosine, water-soluble | 3 |
| Graphite | 12 |
| Lampblack | 3 |

Dissolve the soda in 10 parts of the water and add the rosin to this solution kept at about 100°F. The wax is melted on a water bath. Add the naphtha and continue heating to cause solution; this is then poured slowly into the warm soap solution, with stirring. The blacks are stirred into the balance of the water, kept at 100/F., and the wax emulsion is added with vigorous agitation. Package in glass containers.

Another indicative, up-to-date formula for making an emulsion type liquid stove polish is given in an industrial publication, (14) as follows:

| | Parts |
|---|---|
| Montan, wax, crude | 5.0 |
| Rosin (D to K grades) | 1.5 |
| Paraffin wax (40-42°C.) | 2.5 |
| Diglycol stearate | 2.5 |
| Potassium carbonate | 3.5 |
| Graphite | 50.0 |
| Bone black | 20.0 |
| Nigrosine, oil-soluble | 3.0 |
| Turpentine (or substitute) | 97.0 |
| Water | 115.0 |

Melt the waxes together with the dye, then thin with turpentine and mill in the graphite and bone black. The stearate, rosin and carbonate are heated together in the water until homogeneous, and added slowly with high speed agitation.

SOAPS, silicate and waxes are used as binding and thickening agents in the production of paste type stove polishes. Soap is a popular material. For example, Hall (1) notes that an excellent polishing product consists of an aqueous paste of graphite, carbon black and high titer soaps. These are mixed at about 50°C. and filled into tins while hot. The containers must be tightly sealed to prevent evaporation of the water.

More detailed formulation data are given in other sources. For example, one simple soap-bound paste stove polish contains: (15)

| | Parts |
|---|---|
| Soaps | 4 |
| Water | 1 |
| Graphite | 1 |

More modern is a polish using diglycol stearate as the major thickening agent. (11) This is prepared from:

| | Parts |
|---|---|
| Gum arabic or dextrin | 1 |
| Water | 45 |
| Nigrosine, water-soluble | 2 |
| Diglycol stearate | 7 |
| Graphite | 45 |

Heat the water and dissolve the gum arabic (or dextrin), add the nigrosine and stearate with good stirring; mix thoroughly with the graphite. Fill into cans while still hot.

Sodium silicate solution is often recommended as a medium for incorporating graphite to make stove polishing pastes. Crowley, (16) for example, suggests that a lustrous durable stove polish may be made by mixing graphite with sufficient water glass to make a paste. He stresses that the paste should be packed in tightly sealed containers to prevent evaporation. If the water evaporates from the polish, the remaining hard mass is entirely useless.

This difficulty can be combatted by including a suitable proportion of a hygroscopic plasticizing material like glycerine. Thus, it has been suggested (12) that one ounce of glycerine be added to each pound of polishing paste made by mixing graphite with asufficient quantity of sodium silicate solution. A few grains of aniline black dye also may be added to deepen the color.

Soap and silicate solution may be combined advantageously to prepare a paste type stove polish. This is indicated in the following procedure presented in the *Manufacturing Chemist*, a British publication:

| | Parts |
|---|---|
| Graphite | 80 |
| Lampblack | 18 |
| Alum, powdered | 12 |
| Soft soap | 7 |

Grind to a paste of suitable consistency with a mixture of equal parts of water and sodium silicate. Fill into tins. When alkali is present it is safer to use black plate tin.

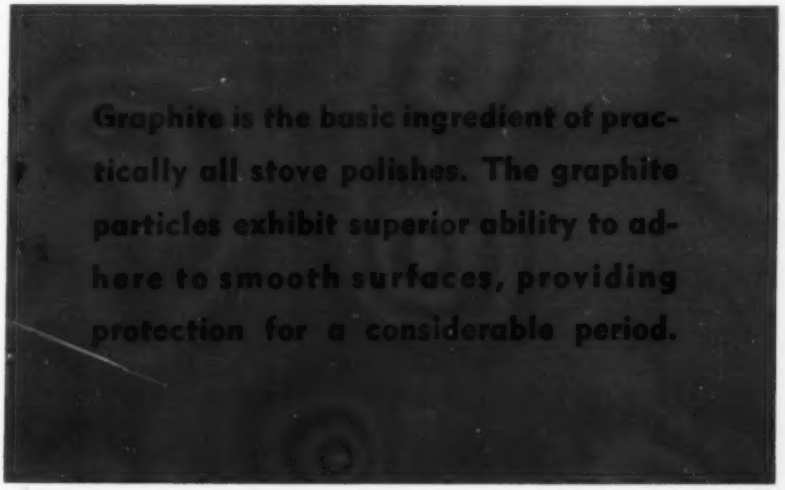
Many paste polishes are prepared with waxes, suitably thinned with solvents, as the thickening and binding agents. One quite simple formula calls for the use of: (15)

| | Parts |
|---|---|
| Ceresin | 4 |
| Oil of turpentine | 25 |
| Lampblack | 3 |
| Graphite | 3 |

Slightly more elaborate, and with lavender oil as a perfuming agent, is the following stove polish in paste form: (5)

| | Parts |
|---|---|
| Paraffin wax | 10 |
| Candelilla wax | 10 |
| Graphite | 20 |
| Naphtha | 59 |
| Lavender oil | 1 |

The waxes, melted on a water bath or with steam, are poured into the naphtha heated to the same temperature by similar means. The graphite and perfume oil are stirred into this solution, which is kept hot until a smooth slurry is formed, at which point heating is stopped. Continue


Graphite is the basic ingredient of practically all stove polishes. The graphite particles exhibit superior ability to adhere to smooth surfaces, providing protection for a considerable period.

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stirring until the mixture begins to stiffen. While still plastic pour into tins to cool and set.

Another blacking, suggested in Bennett's (11) text, is made from:

| | Parts |
|---|---|
| Graphite, flaky | 100.0 |
| Lampblack | 5.0 |
| Beeswax, crude | 1.0 |
| Montan wax, crude | 10.0 |
| Paraffin scales (50-52°C.) | 3.0 |
| Nigrosine, oil-soluble | 0.5 |
| Naphtha | sufficien. |

Melt the waxes, add the graphite and lampblack and then the nigrosine. Finally, with good stirring, add sufficient naphtha to form a paste of the desired consistency.

Variations of the wax-solvent type of binder are those which use asphaltum or other bituminous binders, as is illustrated in the following formula:

| | Parts |
|---|---|
| Kerosene | 38.7 |
| Asphaltum | 14.3 |
| Lampblack | 3.0 |
| Graphite (Mexican) | 44.0 |

Many older type stove polishes contain ferrous sulfate as an active chemical ingredient. Mixed with graphite and bone black, the amount of water added determines whether the product will be a liquid or paste. Thus, a base formula, the consistency of which is controlled by the amount of water added, is as follows:

| | Parts |
|---|---|
| Graphite | 2 |
| Bone black | 2 |
| Ferrous sulfate | 4 |

According to Mason, (5) the purpose in using ferrous sulfate lies in the principle that, upon hydrolysis of the salt to form an acid, the surface of the iron will be etched sufficiently to form a good anchorage for the black pigments. In this way a better and longer lasting polish is obtained. He believes, however, that such polishes can be recommended only for industrial use where there is adequate ventilation.

The formula given by this authority for making a paste polish with ferrous sulfate, is as follows:

| | Parts |
|---|---|
| Bone black | 24 |
| Graphite | 24 |
| Ferrous sulfate | 6 |
| Water | 46 |

STOVE polishes in cake, stick or block form are relatively easy to make. Earlier forms often consisted merely of suitable blends of powdered graphite and carbon black pressed mechanically into blocks. These were moistened with water and applied to iron work and polished. (1) Another variation required the mixing of powdered graphite with oil of turpentine and compressing the mixture (12, 15) into cakes.

More complex are the stove polishes in stick form suggested by Mason. Applicable directly to the metal surface, one of his compositions consists of:

| | Parts |
|---|---|
| Ozokerite | 30 |
| Beeswax | 13 |
| Rosin | 10 |
| Castor oil | 5 |
| Graphite | 33 |
| Carbon black | 9 |

The rosin and castor oil are heated together until clear. The mixture is poured into the previously melted waxes. The pigments are stirred in, heating being continued, until a smooth cream results. The mixture is then allowed to cool until it becomes viscous, at which stage it may be poured into cold molds of the hinge type. The resulting sticks need only be wrapped with a label.

The powder variety of stove polish may be made of finely divided graphite, with or without the addition of lampblack or carbon black. A "fatty" graphite is considered best for the purpose. Applied by mixing with a little water to form a paste, such polishes should be well rubbed to produce a high luster. These simple stove polishes are safe and produce no odor after application and heating.

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## Mildew Control Bulletin

A new bulletin covering the subject of mildew control in storage rooms, in bakeries, on leather goods, fabrics, paints, ropes and books, was recently released by the Florida Engineering and Industrial Experiment Station, Univ. of Florida, Gainesville. The bulletin describes mold and points out methods of its control as well as the protection of fabrics against microbial action. The subject of mildew and the preservation of leather and wood are also discussed. Two useful features of the bulletin are: a table of textile fungicides, their properties and methods of application; and an appendix discussing properties of useful industrial fungicides.

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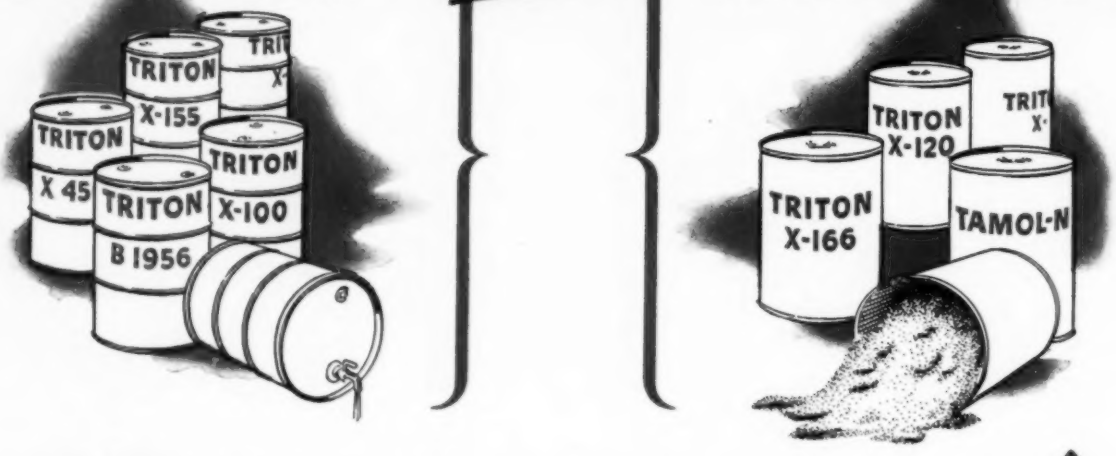


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**TRITON X-45:** An emulsifier for use in oil type agricultural sprays. It is more soluble in oil and less soluble in water than TRITON X-100.

**TRITON B-1956:** Widely used spreader, depositing agent and emulsifier for oil-base mosquito larvicides, dormant sprays and other oil sprays for fruits and vegetables.

### FOR POWDER PRODUCTS

**TRITON X-120:** A carefully developed wetting agent, especially designed for the powder-type products such as DDT wettable powders. Products containing TRITON X-120 are free-flowing, easily wet and readily suspendable.

**TRITON X-166:** A wetting, conditioning and dispersing agent for use in the manufacture of dry insecticides and fungicides such as wettable sulfur.

**TAMOL N:** A conditioner and dispersing agent for use with TRITON wetting agents to furnish ultra-smooth wettable powder products with outstanding suspendability. TAMOL N in conjunction with TRITON X-120 is used in the most efficient DDT wettable powders.

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# FLY LARVICIDE TESTS

**By A. H. Madden, Arthur W. Lindquist, and Howard A. Jones***

Bureau of Entomology and Plant Quarantine, U. S. D. A.

THE noneffectiveness against fly larvae of DDT insecticides tested by McDuffie *et al.* (1946) suggests that these preparations did not penetrate satisfactorily the body covering of the larvae. It seemed possible that DDT in certain solvents, or with certain surface-active agents, might give satisfactory control. Therefore, a series of laboratory tests was conducted against the larvae of houseflies (*Musca domestica* L.).

Larvae 5 to 7 days old were immersed for 5 seconds in the material being studied and then placed on filter paper for a least 5 minutes to decrease the possibility of fumigation. The larvae were held in ¼-pint cartons partially filled with the usual rearing media for 24 hours, and then mortality counts were made. Twenty-five larvae were used in each test, and 25 undipped larvae were held as a check for each series of tests. Since this method provides an easy and rapid means of evaluation, a number of materials other than DDT were also tested.

*DDT in Various Solvents.*—The results obtained with 5 per cent of DDT in various solvents are presented in table 1. For comparative purposes, tests with the solvent alone were made concurrently in all cases. Mortalities with the solutions ranged from 0 to 100 per cent. However, in most cases of high mortality the solvent alone gave at least as good or a better kill than the solution. DDT appeared to increase the kill with some solvents and to decrease it with others.

Several of the solvents, such as Stoddard's solvent, cyclohexanone, dioxane, tetrahydronaphthalene, K-327 Solvent, and ethylene dichloride, caused a high kill. A number of tests with cyclohexanone showed that its effectiveness decreased rapidly with dilution.

A few comparative tests were conducted against larvae of houseflies and blowflies (*Cochliomyia macellaria* (F.)) with cyclohexanone and *o*-dichlorobenzene. The cyclohexanone gave complete kill of the housefly larvae but was practically noneffective against the blowfly larvae. Bushland (1940) reported that this material was nontoxic to larvae of the screwworm (*C. americana* C. and P.). Opposite results were obtained with *o*-dichlorobenzene. This gives an indication of specificity in some of the materials. Dichlorobenzene would have been highly effective against housefly larvae if it had been

**Table 1.—Mortality of housefly larvae immersed for 5 seconds in various solutions containing 5 percent of DDT and in the solvents alone. Average of 4 tests.**

| Solvent | Kill in 24 Hours with— Solution[1] | Solvent Alone |
|---|---|---|
| | Percent | Percent |
| Kerosene | 77 | 37 |
| No. 2 fuel oil | 5 | 1 |
| Benzene | 32 | 3 |
| Xylene[2] | 23 | 49 |
| Stoddard solvent (an aliphatic petroleum fraction) | 92 | 96 |
| *o*-Dichlorobenzene | 22 | 51 |
| White gasoline | 55 | 49 |
| Cyclohexanone | 100 | 100 |
| *o*-Ethoxybenzaldehyde | 45 | 47 |
| Dowtherm A (diphenyl oxide 74%, diphenyl 26%) | 37 | 42 |
| Dioxane | 94 | 94 |
| Carbon Met (chlorinated coaltar fraction) | 36 | 41 |
| Phthalic acid, dibutyl ester | 0 | 0 |
| Phthalic acid, dimethyl ester | 0 | 0 |
| Benzoic acid, benzyl ester | 6 | 4 |
| Tetrahydronaphthalene | 100 | 99 |
| Sesame oil | 5 | 1 |
| Acetone | 76 | 75 |
| Carbon tetrachloride | 23 | 27 |
| Turpentine | 81 | 68 |
| Cottonseed oil | 22 | 2 |
| Methylene chloride | 32 | 39 |
| Solvesso No. 3. (aromatic petroleum fraction, medium boiling range) | 53 | 80 |
| Hercosol No. 80 (chiefly fenchone and camphor) | 60 | 76 |
| Heavy Solvent (a coal-tar fraction) | 65 | 75 |
| K-327 Solvent (chiefly methylnaphthalenes) | 94 | 99 |
| Velsicol NR-70 (chiefly tetramethylnaphthalene) | 16 | 17 |
| S/V Culicide Oil B (chiefly methyl and polymethyl naphthalenes) | 4 | 1 |
| Hi-flash Solvent (a coal-tar fraction) | 75 | 88 |
| Ethylene dichloride | 65 | 92 |
| Trichloroethylene | 52 | 72 |

[1]All solutions were made on a weight-per-volume basis.
[2]25 percent of DDT used.

* This work was conducted under a transfer of funds, recommended by the Committee on Medical Research, from the Office of Scientific Research and Development to the Bureau of Entomology and Plant Quarantine. Howard A. Jones is now with the Unit of Entomological Research of Dodge & Olcott, Inc., Baltimore, Md. Bernard Knecht and Douglass Burnett, Jr., assisted in conducting these tests.

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Table 2.—Mortality of housefly larvae immersed for 5 seconds in various aqueous emulsions, with and without DDT. Average of 4 tests.

| Emulsifier | Kill in 24 hours with— DDP | No DDT |
|---|---|---|
| | Percent | Percent |
| Triton X-100 (polyethylene glycol alkyl aryl ether) | 13 | 3 |
| Span 20 (sorbitan monolaurate) and Tween 20 (sorbitan monolaurate, polyoxyalkylene derivative), equal parts | 3 | 2 |
| Wetsit concentrated (alkylated aromatic sulfonate) | 7 | 18 |
| Areskelene 400 (sodium sulfonate of dibutyl phenyl phenol) | 4 | 5 |
| Alkanol WXN (sodium hydrocarbon sulfonate) | 5 | 7 |

permitted to act as a fumigant as well as a contact insecticide.

*DDT Emulsion.* — Other tests were made with aqueous emulsions of DDT made with different emulsifiers. A concentrate containing 25 per cent of DDT, 10 per cent of emulsifier, and 65 per cent of xylene was diluted with water to make a 5 per cent DDT emulsion. For comparative tests the same formula without DDT was diluted with water to produce an emulsion containing the same amount of emulsifier and solvent. Table 2 shows that poor results were obtained in all cases and that the mortality was lower when DDT was included in the formula.

*Other Insecticides and Miscellaneous Materials.*—The following materials, which include a number of surface-active agents and several of the common acids and alkalis, were also tested against housefly larvae: (See table cols. 2 and 3).

Benzene hexachloride and 2,4-dinitro-6-cyclohexylphenol were among the most toxic of these materials. The body covering of the larvae apparently showed a high degree of resistance to penetration of hydrochloric acid, potassium hydroxide, ammonium hydroxide, and mercuric chloride, since the toxicity obtained with these materials was also negligible.

## Summary

Tests of DDT in various solvents against larvae of the housefly (*Musca domestica* L.) showed that this insecticide did not add materially to the mortality obtained with the solvent alone. The solvents producing the highest kill when combined with DDT were equally or more effective when tested without DDT. Poor results were obtained with DDT emulsions. Among other materials tested benzene hexachloride and 2,4-dinitro-6-cyclohexylphenol were the most toxic. The toxicity obtained with hydrochloric acid, potassium hydroxide, ammonium hydroxide, and mercuric chloride was almost negligible, indicating that the body covering of the larvae gave a high degree of protection against these materials.

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McDuffie, W. C., A. W. Lindquist, and A. H. Madden. 1946. Control of fly larvae in simulated pit latrines and in carcasses. Jour. Econ. Ent. (In press.) (approved 7-8-46)

| Material | Percent kill in 24 hours |
|---|---|
| Sodium arsenite 0.6% | 9 |
| p-Dichlorobenzene 75% in o-dichlorobenzene 25% | 56 |
| Benzene hexachloride 5% plus Triton X-100 5% in benzene | 100 |
| Benzene hexachloride, crude (10-12% gamma isomer) | |
| In benzene: | |
| 10% | 100 |
| 5% | 78 |
| 2.5% | 76 |
| In kerosene:[1] | |
| 10% | 55 |
| 5% | 46 |
| 2,4-Dinitro-6-cyclohexylphenol 5%: | |
| In benzene | 100 |
| In No. 2 fuel oil | 100 |
| Pyrethrins: | |
| 0.5% in kerosene | 37 |
| 0.25% plus "piperonyl cyclohexenone" 1.25% in kerosene | 94 |
| 0.5% plus "piperonyl cyclohexenone" 2.5% in kerosene | 77 |
| 2,4-Dinitroanisole 5% in kerosene | 62 |
| Thanite (thiocyanoacetic acid, isobornyl ester) (steam sparged) 10% in kerosene | 71 |
| Thanite 10% in kerosene | 82 |
| Lethane 384 Special (an aliphatic thiocyanate) 10% in kerosene | 77 |
| Triethanolamine: | |
| Undiluted | 9 |
| 10%[2] | 12 |
| Hyamine 1622 (p-diisobutylphenoxyethoxyethyl dimethyl benzyl ammonium chloride) 25%[2] | 6 |
| Hyamine 10X (diisobutylcresoxyethoxyethyl dimethyl benzyl ammonium chloride) 25%[2] | 7 |
| Triton X-100 | 20 |
| Pyridine 10%[2] | 9 |
| Morpholine: | |
| Undiluted | 100 |
| 10%[2] | 4 |
| Areskap-100 (sodium monosulfonate of monobutylphenylphenol) 25%[2] | 1 |
| Triton W-30 (sodium salt of aryl alkyl ether sulfate) | 3 |
| 2-Phenylcyclohexanol | 89 |
| Hydrochloric acid, concentrated: | |
| 5% | 0 |
| 10% | 18 |
| 25% | 22 |
| Potassium hydroxide:[2] | |
| 0.01% | 0 |
| 1% | 1 |
| 10% | 0 |
| Ammonium hydroxide (60%), 1% | 0 |
| Mercuric chloride 5%[2] | 0 |
| Picric acid[2] | 0 |
| Tannic acid 5%[2] | 2 |
| Formaldehyde 37%[2] | 3 |
| Sodium chloride[2] 10% | 1 |

[1] Not completely soluble at this concentration.
[2] Aqueous solutions.

## Triglyceride Conversion

When triglycerides are heated with glycerol, monoglycerides are obtained and when monoglycerides are heated, they yield diglycerides and glycerol, and triglycerides and glycerol. N. Ivanoff. *Bull. matieres grasses inst. colonial Marseille* 29, 51-6.

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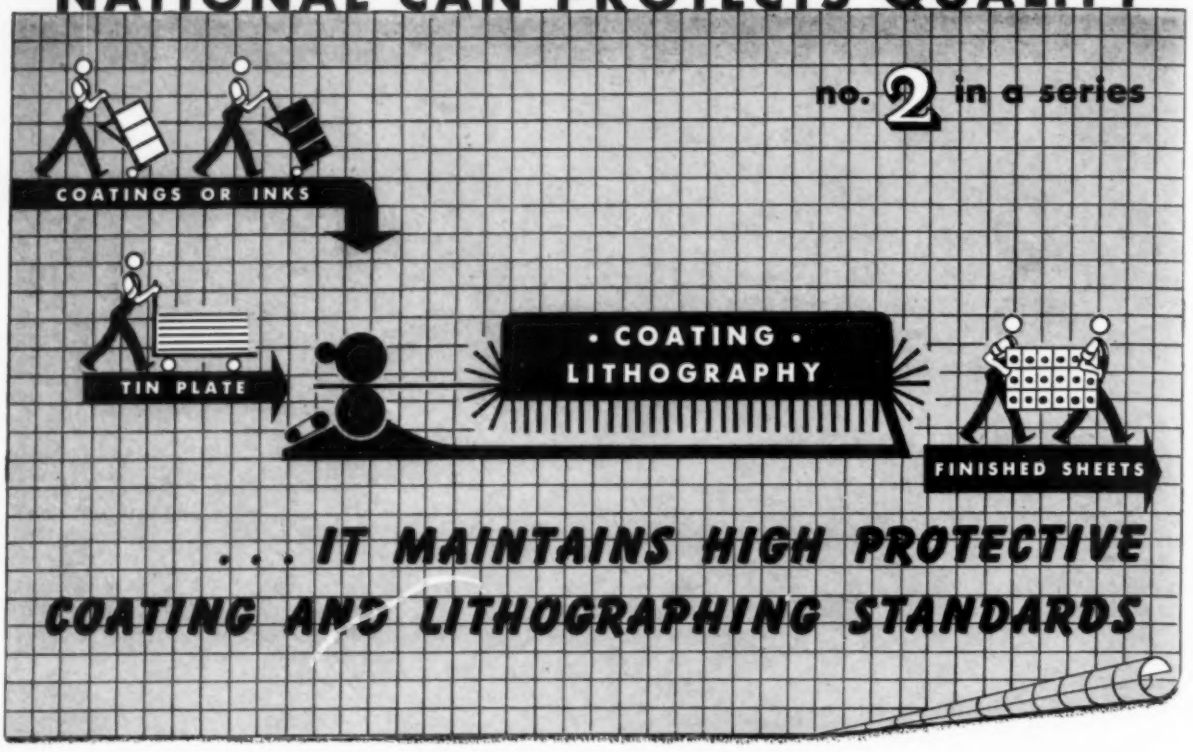


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# Cation-active Agents

AMONG the cation-active agents which are becoming important industrially are the amine salts such as "AM 1120" and "1140" made by the Armour Chemical Company, Chicago. Although these amines in the form of bases are strong skin irritants, as salts they have no toxic properties and can be put to use as household cleaners and disinfectants. Their low cost makes possible applications worth investigating. Because of their strongly colloidal nature in solution, they have a detergent power on a par with that of soap, but in an acid medium. They are suitable for cleaning wool and cotton. In tests carried out in an electric washing machine, with 0.066 per cent of hexadecylamine acetate and a pH of 3.5 at 50°C., dirt was removed from wool as easily as with soap, without matting the wool. The same type of solution has been found to be extremely successful as a cleaner for dairy utensils, even those having an adherent milky crust.

The bactericidal value of the $C_{12}$-$C_{14}$ amine salts is very good; they kill in five minutes *S. aureus* and *B. coli* in concentrations of 1:10,000. The microbic flora contained in saliva is destroyed at a concentration of 7:1000.

### Substituted Pyridines

Substituted pyridines such as *alpha* and *gamma* methyl picolines are condensed with lauryl bromide or chloride in the presence of sodium amide. The antibiotic action of the more active compounds in this class is shown in the table: (See Below) The results indicated that the $C_{12}$ chains confer the optimum bactericidal power, as is usual.

### Quaternary Ammoniums

Comparative washing tests with artificially soiled wool flannel gave the following results: A one per cent solution of common soap removed 37 per cent of the dirt, a cresylic solution of saponin five per cent, a one per cent solution of trisodium phosphate 23 per cent, a 0.03 per cent solution of lauryl colamino formyl methyl pyridinium chloride 59 per cent, and a 0.06 per cent solution of the same quaternary ammonium compound 71 per cent of the dirt.

No relationship exists between the bactericidal and detergent powers of cation-active compounds. The $C_{10}$-$C_{12}$ chains confer the highest bactericidal power, but the $C_{16}$-$C_{18}$ chains are less soluble, more colloidal, and have better dispersing power.

One of the uses of these cation-active soaps is sterilization of surgeons' hands before operating. They were used for this purpose in the United States Army in all its theaters of operation. Another use is incorporation in toothpastes, where their particular properties are highly advantageous. Experimental work has shown that dimethyl lauryl benzyl ammonium chloride, known also as "Zephyrol," "Zephiran," and "Roccal," is an aid in preventing dental caries. It has a low toxicity for mucous membranes, has high detergent properties and penetrates to some extent into cavities. A solution of 1:1,000 of this agent, used in the mouth, was found to attach itself to tartar and give a relative sterilization. It is believed that the regular use of such synthetic detergents would exert a prophylactic action on dental caries. Another investigation showed that a 1:4,000 solution of cetyl pyridinium chloride sterilized 90 per cent of the bacteria in the mouth. It was more active than oxygenated water or mercury salts.

Phospholipids inhibit the action of cation-active agents. Just what the mechanism is of the bactericidal effect has not been proven, although various suggestions have been advanced. Reduction of interfacial tension does not appear to be indispensable, although it certainly helps to bring the fatty chain into contact with the bacteria. The quality of the ion and the need for an ionized form appears to be of paramount importance, and is closely related to pH. It has been shown, for example, that the sodium salt of dodecyl hydrazine is deprived of all bactericidal properties at pH 8.5, while in the cationic form at pH 6 it destroys *S. aureus* in the concentration of 1:25,000, but does not destroy it at pH 4. Apparently some reaction with protein occurs, but the "how" and "what," of this reaction remains to be proved. J. Ripert and J. Sisley. *Soap, Perfumery, Cosmetics 19*, 83442 (1946).

Antiobiotic Action

| *Compounds* | *Effective Concentrations against* | | |
|---|---|---|---|
| | *Staphylococcus Aureus* | *B. Subtilis* | *B. Coli* |
| gamma-dodecyl pyridine hydrochloride | 1:75,000 | 1:17,500 | 1:17,500 |
| alpha-dodecyl pyridine hydrochloride | 1:37,000 | 1:17,500 | 1: 7,500 |
| alpha-nonadecyl pyridine methyl chloride | 1:15,000 | 1: 7,500 | 1: 7,500 |
| di-gamma-octadecyl picoline hydrochloride | 1: 7,500 | 1: 3,750 | 1: 2,500 |

### Control of Ear Tick

Ear ticks can be controlled very effectively by brushing the ears of cattle with a mixture designated as "Stock 1029." This is a mixture of pyridine in an adhesive containing 45 per cent rosin, 40 per cent "Hercolyn" (hydrogenated methyl abietate) and 15 per cent dibutyl phthalate. The ear treatment should be supplemented by spraying or sprinkling the salt troughs and the areas under them with a mixture of equal parts of kerosene and used lubricating oil. C. S. Rude and H. E. Parish. U. S. Dept. Agr. Bur. Entomol. and Plant Quarantine *E-695* (1946).

### Shark Oils

The liver of the Pelerin, a large edible shark, represents about 30 per cent of the body weight and contains 75-90 per cent of an easily extracted oil. For the last three years these fish have been appearing along the coast south of Brittany. So far their oils are used mostly in making soap, but they could be treated to make them suitable as food, after some of the vitamins are extracted. E. Lemaire. *Genie civil 121*, 155-6; through *Chem. Abs.*

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## TESTING DISINFECTANTS

(*From Page* 131)

herent weaknesses that have eliminated them from serious consideration. We hold that the nature of bacterial reproduction and growth is such that any apparent residue of living infectious organisms constitutes a potential source of infection and that anything less than a complete kill fails to give the protection implied in the definition of the word disinfection. In this connection, attention must also be directed to the many chemical compounds that exist which are not disinfectants but which do under many conditions give high percentage kills of test culture organisms.

If changes in our official procedures can be made which will more adequately and more truly express the relative merits of disinfectant preparations, then we will have made true progress both in protecting the consumer and promoting fair trade practices. We should resist any change that does not do this. We should be satisfied with nothing less than this.

## NOVELTY SOAPS

(*From Page* 36)

which may be cut into strips and the resulting leaflets may be put up in pad or book form. Perfumes or disinfectants may be added to the initial cellulose-detergent mixture. Of interest in connection with this procedure is the recent announcement of the production and marketing of individual soap flowers made with carboxymethyl cellulose as the film-forming and binding agent.

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(*From Page* 61)

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### PSA Appoints Committees

The appointment of three committees of the Potash Soap Association were reported by its secretary A. P. Federline on March 5, 1947. Members of the Publicity & Promotion Committee are: Messrs. Bachrach, Brownstein, Cooley, Dick, Jr., Graceman, Gwinner, Hillyard, Hockwald, Lichtenberg, Murphy, Sr., Peters, Schaad, Scholler, Webb, Young and Zucker. To the Statistical and Management Committee were appointed: Miss Simson and Messrs. Allison, Cooley, Crowell, Fuld, Gerson, Haag, Moore, Peters, Scholler, Schwarcz, Selig, Webb, Wheeler, Young and Zucker. On the Technical Committee are: Messrs. Allison, Bachrach, Breck, Dick, Jr., Freudenthal, Fuld, Gerson, Gwinner, Haag, Kranich, Moore, Murphy, Jr., Pollnow, Jr., Schwarcz and Weirich.

### Gamson New Rokeach Head

W. Henry Gamson, a nephew of Dr. Aaron Rokeach, late president of I. Rokeach & Sons, Inc., Brooklyn kosher soap makers, was elected president and chairman of the board to succeed his uncle, it was announced Feb. 23. He is a grandson of the founder of the company, Israel Rokeach.

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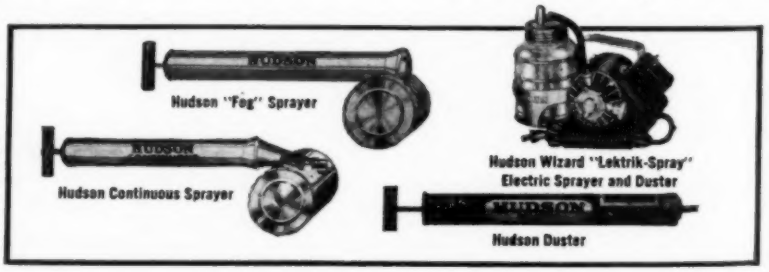

An interesting color movie entitled "Our Constant Enemy, the Insect," and depicting the use of insecticides and sanitizing agents in agriculture and industry was recently released by Rohm and Haas Co., Philadelphia. Scenes from the picture show (left to right) (1) a milk can being given the final rinse and a sanitizing agent being added to the rinse water; (2) the final and sanitizing rinse tank used in behind-the-counter washing of dishes; (3) the use of an extension nozzle on the end of a power spray hose being used to spray insecticide between the crevices of stacked cartons in an industrial warehouse.

## New Low Pressure Aerosol

"Jet Power Insect Killer" a new low pressure type aerosol, was reported by Airosol, Inc., Neodesha, Kansas, to be ready for delivery in April. The manufacturer claims greater knockdown power for its new product, as well as longer residual value than previous aerosol insecticide bombs. The new bomb uses a recently perfected blend of two types of "Freon" and a third non-toxic liquefied gas to produce a non-flammable low pressure propellent. This propellent mixture is said to be more efficient because it provides larger insecticide particles for insect impact, hence greater killing power.

Like "Sterel," the company's new germicidal aerosol, the "Jet Power Insect Killer" was developed by Dr. Lyle D. Goodhue, director of research, Airosol, Inc. Dr. Goodhue, while senior chemist in the Bureau of Entomology and Plant Quarantine, USDA, was instrumental in the development of DDT aerosol bombs for the armed forces. He stated that the formula contains pryethrum extract, for the purpose of paralyzing and killing many insects, and piperonyl butoxide, new synergist and toxicant which increases effectiveness of the pyrethrum. DDT is also included to increase kill, and "Velsicol 1068" is used because of its effectiveness against the German cockroach, ants, silverfish, carpet beetles, clothes moths and numerous other insects.

Dr. Goodhue pointed out that a type of activated mineral oil is being used which adds to the effectiveness of all the insecticides used in the formula. It is slowly volatile and leaves no stain. In reference to formula, he said that "Freon-12" is used to some extent, much less than is required by high pressure aerosols, since it is combined with "Freon-11" and a third non-toxic liquefied gas. The mixture disperses the insecticidal agents in a particle size that is most effective. Because the new propellent mixture is a solvent in itself, "Jet Power Insect Killer" is said to eliminate the need for solvents.

The container has an automatic mixing chamber that disperses the insecticide through a unique push-button type valve which has a built-in directional spray nozzle, insuring fool-proof operation according to the manufacturer. The product will retail at $1.69.

## Officials Organize

A new Association of American Economic Poisons Control Officials was organized at a meeting in Portland, Ore., in January. The announced objective of the new organization is to promote uniform and effective legislation, definitions, rules and enforcement of laws relating to sale and distribution of insecticides, fungicides and other economic poisons.

Dr. J. L. St. John state chemist in charge of the Washington Division of Chemistry, was elected president of the new organization, and Allen B. Lemmon, chief of the California Bureau of Chemistry was elected secretary. Officials of other states are to be asked to join the new organization, and a general meeting will be held next fall.

## Foundation Appoints Pijoan

Dr. Michel Pijoan was recently appointed to the Francis P. Garvin professorship of chemistry and director of the Chemical Foundation, Inc., research laboratories at the University of Colorado. Dr. Pijoan, as a lieutenant commander was head of the Navy's biochemistry section at Bethesda, Md., during the war.

## Plan 85% Can Allocation

American Can Co., New York, announced Feb. 28th, that it will deliver cans at the rate of 85% of the base selected by customers under the 1947 allocation plan of January. Two of the bases set up then called for 80% of the area of the plate in cans listed in a customer's present contract schedule, which were shipped to him in the calendar year 1945 or 1946. Two called for 100% of the plate used in either 1940 or 1941. Four other bases called for 80% of either 1940 or 1941 usage adjusted to reflect business growth in 1945 or 1946.

**Chemist:** Young man from India seeks temporary job offering opportunity for obtaining experience in production of soaps, cosmetics, and perfume. Has had some experience in soap boiling in India. Address Box 719 c/o *Soap & Sanitary Chemicals.*

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This leader in the field of synthetic insect-toxicants has demonstrated a remarkable degree of efficiency in the control of household, institutional and agricultural pests. Deadly, powerful, and dependable, "Velsicol" "1068" insect toxicant is easily formulated as a base oil solution, a wettable powder, an insecticidal dust, and as an emulsion concentrate.

"Velsicol" "1068" insect toxicant is available in both the technical grade which consists of a minimum of 90% of the chlorinated hydrocarbon, $C_{10}H_6Cl_8$, and as the 20% concentration grade which is a 20% solution of the chlorinated hydrocarbon in refined kerosene.

# VELSICOL LEADS the Insecticide Field!

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# TECHNICAL Briefs

*From Current Literature in the Sanitary Products Field*

## Report on DDT Analogs

A study of the insecticidal powers of forty-one analogs of DDT currently marketed in the United States under various trade names reports that while some of the compounds showed insecticidal powers of the same type as DDT, the most toxic compounds were those whose molecules most resembled DDT. Any modification of the para-dichlorodiphenyl- trichloro-ethane structure tends to decrease insect toxicity. A decrease in insecticidal power results when any of the following changes in the molecule are made: Elimination of the chlorine atoms from the benzene rings, shifting one chlorine atom from the para to the ortho position, substitution of other halogen atoms for the para positioned chlorine atoms of the ethane nucleus, dehydrogenation of the ethane nucléus, or by making hydroxy, alkoxy, or tetra-substituted compounds, J. R. Busvine. *J. Soc. Chem. Ind.*

## Octa-Klor Tested on Ants

"Octa-Klor," a new chlorinated hydrocarbon manufactured by Julius Hyman & Co., Denver, was recently the subject of experiments at Oklahoma Agricultural and Experiment Station which indicate its probable usefulness against the red harvester ant. Tested in comparison with hexachlorocyclohexane, "Octa-Klor" ($C_{10}H_4Cl_4$) was claimed to be the most effective toxicant of those yet tested; 100cc of a 3 per cent v/v concentration was said to have given better control than the other materials tested. It was demonstrated that a 2.5-3 per cent solution of the compound will destroy an ant colony within 24 hours, and that it does not act as a repellent or scattering agent, allowing new colonies to become established elsewhere.

## DDT Determined in Fat

A procedure is described for the determination of DDT in animal fat and other fatty types of samples. After a careful treatment of the sample the final evaluation is colorimetric. M. S. Schechter, M. A. Pogorelskin, and H. L. Haller. *Anal. Chem. 19,* 51-3 (1947). (Edit. Note: formerly *I. & E. Chem. Anal. Edit.*).

## Modification of Waxes

The properties of natural waxes such as beeswax, carnauba wax, candellila wax, Japan wax, etc. are modified by heating with various reagents. For example, beeswax of melting point 64°C., acid value 20.2, and saponification number 93.3, was heated with 5 per cent of sodium bisulfite for 5 hours at 300°C. under a blanket of carbon dioxide. The treated wax had the following properties: melting point 137°C., acid value 1.95. and saponification number 96.4. Various modifying agents are suggested. The products are useful in polishes and as impregnants for carbon paper and typewriter ribbon. L. Auer. U. S. Patent No. 2.406,336.

## Peanut Product Rat Bait

A new product said to be particularly suitable for attracting and trapping rodents is an "extracted peanut product" offered to the trade by Sparhawk Co., producers of biological specialties, Sparkill, N. Y. Two advantages are claimed for the new product which derive from the fact that it is not distilled or extracted with alcohol, both of which processes tend to destroy the fresh, aromatic odor so needed for the bait. It is reported that the material does not dry up or lose its odor strength and remains pungent for long periods of time when exposed to the air.

## DDT Toxicity Chemistry

A number of points interesting to the insecticide chemist regarding the correlation between chemical constitution and toxicological action of DDT were reported in a paper on: "The Toxicity and Toxic Manifestations of 2.2-Bis-(*p*-chlorophenyl)-1,1,1-Trichloroethane (DDT) as Influenced by Chemical Changes in the Molecule", by W. F. von Oettingen and N. E. Sharples, Industrial Hygiene Research Laboratory, National Institute of Health, U. S. Public Health Service, Bethesda, Md., available as a reprint from the *Journal of Pharmacology and Experimental Therapeutics, 88,* 4, Dec. 1946. The authors investigated the toxicity and toxicological manifestations of 22 derivatives of DDT and offered the following conclusions: (a) that the characteristic action of DDT depends upon the presence of the trichloroethane group, (b) that it also depends upon substitution of the hydrogen atom in *para* position of the phenyl ring by halogen, (c) that the chlorine in this position can be replaced by bromine, iodine, fluorine, and the ethoxy and propoxy radicals without attenuating materially the toxic manifestations of DDT, and (d) that substitution of chlorine by a hydroxy, acetoxy, methoxy, butoxy or amyloxy group yields ineffective compounds. The researchers also discussed the relation of these findings to the rate of dehydrochlorination and their solubility in oil. It was shown that introduction into the phenyl ring of a butoxy and amyloxy group instead of chlorine produces a physiological antagonism. It was suggested that the inactivity of some of the DDT derivatives studied may be due to their fate in the metabolism.

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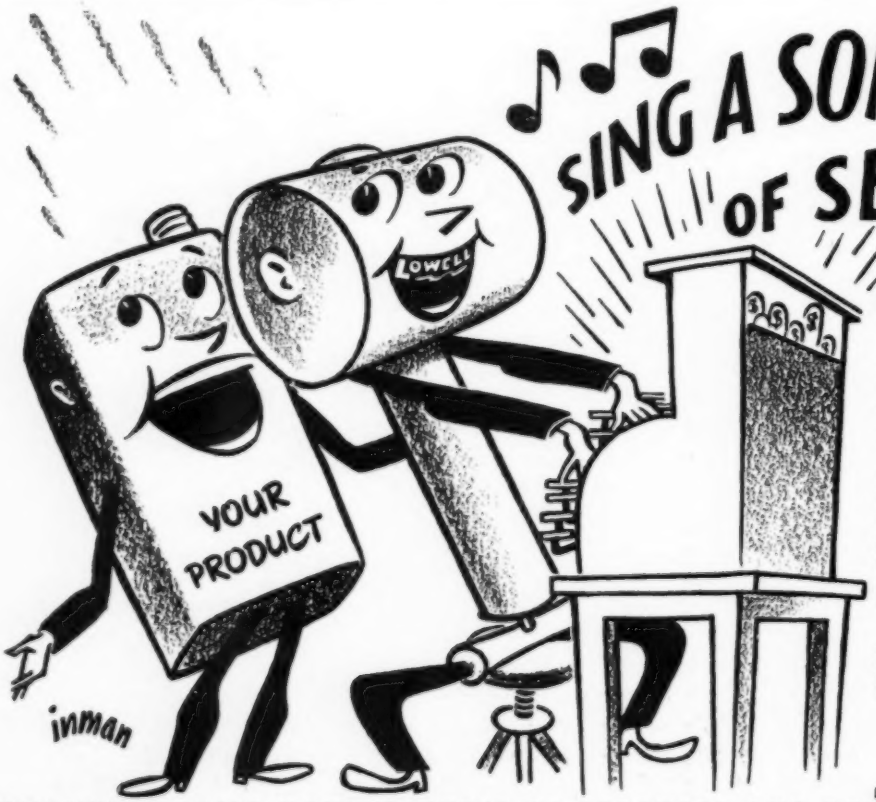


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## Auto-body Polishes

A very useful emulsifying material for polishes is morpholine in the form of one of its soaps, such as morpholine oleate. Morpholine is a colorless liquid with an ammoniacal odor which is greatly reduced on dilution. A strong alkali, it combines with fatty acids to form excellent soap emulsifiers. Aqueous morpholine solutions evaporate with little change in composition and with maintenance of a constant alkalinity. During the final stages of evaporation the amine is almost completely vaporized with the water, to leave an insoluble film resistant to rain water. The fine particle size of morpholine emulsions also helps produce films of high gloss. Incorporation of a water-soluble resin assists in producing a no-rub, dry-bright cleaner polish.

Only mild abrasives should be employed except in a straight-forward cleanser intended for occasional use, to be followed by a real waxing job.

A new polish should be tried out by practical use before sale. Shelf-testing is also an important feature. The following formula contains a small amount of morpholine soap as emulsifying agent:

| | *Per Cent* |
|---|---|
| Carnauba wax or similar hard wax | 2 |
| Beeswax | 1 |
| Light mineral oil | 8.5 |
| Oleic acid | 0.8 |
| Morpholine | 0.7 |
| Rosin | 0.2 |
| Fuller's earth | 10 |
| Tripoli or other abrasive | 15 |
| Methyl cyclohexanol | 0.8 |
| Amyl acetate | 1 |
| Water | 60 |

Rosin helps to reduce streaking, although present in only a low proportion, and is best pre-incorporated with 10 times its weight of water and half its weight of ammonia. The proportion of water may be increased if desired, by addition of an aqueous dispersion of methyl cellulose.

Another formula utilizes a triethanolamine soap:

| | *Parts* |
|---|---|
| Diatomaceous earth | 28 |
| Isopropyl alcohol | 30 |
| Glycerine | 10 |
| Paraffin | 11 |
| Machine oil | 50 |
| Colloidal clay | 2 |
| Triethanolamine linoleate | 1 |
| Water | 175 |

The presence of isopropyl alcohol promotes wetting of the surface, while glycerine slows down evaporation.

A simple dispersion is the following:

| | *Per Cent* |
|---|---|
| High melting wax | 1 |
| Methyl cellulose | 1.5 |
| Light colored mineral oil | 10 |
| Kieselguhr or amorphous silica | 15 |
| China clay | 2.5 |
| Water, to make 100 parts | |

Methyl cellulose has the advantage over natural gums of being more uniform in quality and highly resistant to bacterial decomposition. Although only 1 per cent of wax is present, the resulting performance is superior to that with no wax.

Suitable substitutions can no doubt be made in these formulas if the function of the various ingredients is understood. J. M. Vallance. *Manufacturing Chemist 27*, 478-83 (1946).

—— ♦ ——

## Chem. Specialties Reviewed

Many helpful suggestions on chemical specialties manufacture are to be found in "Chemical Specialties," published by Chemical Publishing Co., Brooklyn, near the end of 1946. The new 825 page book, a symposium compiled by M. Bennett, technical director, Glyco Products Co., New York, is the next step beyond the Formularies that Mr. Bennett has offered in the past and gives much valuable information in detail on how to become established in a chemical specialty business.

In addition to being a formulary this new text brings to the reader the experience of many business men on all phases of the chemical specialty business. Raw materials are discussed with regard to handling, costs, legal restrictions, and so forth. The chapter on processing procedure and equipment discusses the laboratory phase, the compounding room, testing, process equipment containers and packing, receiving, and shipping. The many illustrations in the chapters on equipment and packaging are helpful. The chapter on marketing offers guidance on the introduction of a product, selling and new product development. The specialty business has always been weak on such points of business organization and law, accounting, and finance, all of which are covered at length in the chapter or business administration. Much information is offered on the federal food, poison, and insecticide regulations.

In studying the soap section of the formulary, the reviewer found a vagueness and confusion that has existed in past formularies. The formula and procedure for rosin tallow soap is confusing to the reader and needs clarification. It is questionable if the offering without further comment of a formula for soap powder such as follows is of much value to the reader: soap . . . 42 parts, soda ash . . . 42 parts, borax (powdered) . . . 15 parts, and salt . . . 1 part.

It is thought that more attention should have been given to the subject of attractive and eye-appealing packaging and displays and the illustrations given in this section lack sharpness of detail.

There is a novel presentation on compounding chemistry and chemicals which will be of considerable help to the layman and also complement the knowledge of those who have had formal study. A most valuable feature of the book is a reference table in the appendix of 18 pages of trade-name chemicals together with the names and addresses of the suppliers. Mr. Bennett makes the point that it is always wisest to consult with a competent technical consultant before difficulties are encountered.

—— ♦ ——

## Refining Palm Oil

Palm oil containing 28 per cent of free fatty acids is neutralized with a solution of soda ash. No foaming is encountered at temperatures below 60°C. with a 15 per cent aqueous solution of soda ash. E. Andre and P. Cuvier. *Bull. mat grasses inst. colonial Marseille 29*, 152-5; through *Chem. Abs.*

*Carnauba Competition . . .*

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## Effect of Mists on Insects

In flying through an insecticidal mist, insects such as flies and mosquitoes accumulate most of the dose on the wings. If the insecticide contains the dye Sudan III, the dye either penetrates the wings directly, and appears later in the malphigian tubules, or it may be removed by the insects and be absorbed through the legs.

Accumulation of spray by flying insects was determined as follows: Known quantities of Sudan III were dissolved in benzene. The solution was added to the insecticide in odorless kerosene until the spray solution contained 50 per cent of each solvent. Extracts of the sprayed insects were compared with standards prepared by diluting the spray solution with odorless kerosene.

Within limits, the dose accumulated by flying insects increases with the activity of the insect and the size of the mist particles. The maximum LD 50 value, in milligrams per kilogram for two insects and three insecticides, as determined by the colorimetric method were as follows: DDT, *Musca*, males 6.0, females 9.0—*Aedes*, males 5.5, females 8.0; hexachlorocyclohexane (666), *Musca*, 2.0, 3.0—*Aedes* 3.0, 3.5; pyrethrins (0.1 per cent weight to volume), *Aedes*, 0.5, 1.0; pyrethrins (2 per cent), *Musca*, 31.0, 38.0. W. A. L. David. Ann. Applied Biol. *33*, 133-41 )1946).

## Germicidal Fabrics

A study of 250 compounds for treating fabrics to make them germicidal, shows that a great number of manufacturers make fantastic claims not only about the efficiency of their products, but also about their low toxicity and nonirritating properties. This is dangerous. Some of the compounds tested are so toxic or so irritating that their use according to the recommendations of the manufacturers, can cause very severe dermatitis, or even death of infants.

The patch test described by Drs. Schwartz and Peck has proved that many germicides believed to be nonirritating are actually harmful to human skin and should not be used for treatment of fabrics to be worn next to the skin. Prejudices against all mercurials for this purpose, however, are unfounded, since some long-chain phenyl mercury derivatives do not cause skin irritation as proved by patch tests. L. C. Barail. *Am. Dyestuff Reporter 35*, 521-4 (1946).

## Bactericidal Action and pH

A commercial alkyl aryl sulfonate (Nacconol NR) at a dilution of 1:500 kills *Staphylococcus aureus* at 37°C. within 5 minutes at pH 2 and 3.8, and within 10 minutes at pH 11.9. At intermediate pH values, 99 per cent or more of the organisms are killed within 5 minutes and sterility is attained in every case within 48 hours or less. "Nacconol NR" is more bactericidal in acid than in alkaline solutions. L. H. Flett, R. C. Haring, A. F. Guiteras, and R. L. Shapiro. *Am. Perfumer 48*, No. 12, 63-9 (1946).

## Determination of DDT

The determination of *p,p'*-DDT in technical DDT is based on liberation of hydrochloric acid by alcoholic potassium hydroxide and Volhard titration of the hydrochloric acid. At higher temperatures and after prolonged reaction, *o,p'*-DDT will also lose hydrochloric acid. Hence dissolve 250 milligrams of DDT powder in the cold in 30 cc. of 0.1 Normal alcoholic potassium hydroxide. Add water, nitric acid, and ferric ammonium sulfate, and titrate with 0.1 Normal silver nitrate solution; 1 cc. of 0.1 Normal silver nitration solution titrates 35.5 milligrams of *p,p'*-DDT. E. H. Vogelenzang and J. M. H. van de Sande. *Pharm. Weekblad 81*, 145-8 (1946); through *Chem. Abs.*

## X-ray Studies of DDT

A sample submitted as DDT was proved by X-ray methods to be DDD, which demonstrates the utility of these methods in analysis. An X-ray study is reported of a number of crystalline compounds analogous with DDT, showing how the data differentiate the compounds. M. Schneider and I. Fankucheu. *J. Am. Chem. Soc. 68*, 2669-70 (1946).

## Feeds 666 to Hosts

A new way of killing insects, by feeding the insecticide to the host, has been reported by Dr. Botha De Meillon of the South African Institute for Medical Research, Johannesburg, So. Africa. He fed powdered "Gammexane" in agar to a rabbit in 50 mg. daily doses and found that various insects from healthy stocks, when placed on the rabbit's ear developed toxic effects after the rabbit had eaten 100 mg. of the insecticide. Dr. De Meillon reported (*Nature, 158*: 839, 1946) the results of the experiment on the bedbug; the mosquito which transmits yellow fever and dengue; and the insect which is the cause of African tick fever. Dr. De Meillon believes that a colony of insects would have little chance of surviving many generations if they feed continuously on "Gammexane"-fed animals. The *aedes aegypti* mosquito females which were fully fed died within 24 hours. The ticks died within ten days. He stated that the toxicity of "Gammexane," when fed to animals continuously must still be studied very carefully.

## Cuticle Permeability

The rate of penetration of insect cuticle by various insecticidal materials is directly correlated with their toxicities to aphids. The organic thiocyanates such as Lethane, and anabasine as free base penetrated the cuticle readily, but the alkaloid sulfate penetrated more slowly. M. I. Il'inskaya. *Compt. rend. acad, sci.* U.R.S.S. *51*, 557-9 (1946); through *Chem. Abs.*

## Insecticidal Wall Washes

Experiments on red flour beetles (*Tribolium castaneum*) show that DDT in an oil-in-water emulsion containing 0.25-1 per cent of lime, when applied to concrete wall surfaces is completely ineffective against these insects. DDT emulsion containing 0.140-0.280 per cent of chalk, and "666" emulsions containing 0.140-0.558 per cent of chalk gave good insecticidal effects that persisted 2 months after application. Ordance Laboratories. *J. Sci. & Ind. Research* (India) *4*, 493-5 (1946); through *Chem. Abs.*

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# TRADE NEWS . . .

## Mutual Appoints Moore

A. J. Moore has been appointed factory manager of the Mutual Chemical & Supply Co., soaps and sanitary products, Columbus, Ohio, according to a recent announcement by the company. In his new position, Mr. Moore will be responsible for all quality, production, and shipping and receiving materials. Clayton Cummings will serve as his assistant. Mr. Moore has had a wide background of experience in laboratory work.

## Unexcelled Names Bean

Henry S. Bean, formerly with Ethyl Securities Corp., New York, and Lever Brothers Co., Cambridge, Mass., has been appointed advertising and sales manager of Unexcelled Chemical Corp., New York, insect repellent.

## Appoint NAIDM Committees

N. J. Gothard, president of the National Association of Insecticide & Disinfectant Manufacturers, has announced the list of new committee appointments for 1947. Committee chairmen are as follows: Executive Committee, A. W. Morrison, Socony-Vacuum Oil Co., New York; Associate Members Committee, J. B. Magnus, Magnus, Mabee & Reynard, Inc., New York; Aerosol Committee, John H. Mills, Bridgeport Brass Co., Bridgeport, Conn.; Exhibit Committee, L. J. Oppenheimer, West Disinfecting Co., L. I. City, N. Y.; Legislative Committee, W. J. Zick, B. Heller & Co., Chicago; Membership Committee, D. W. Lynch, John Powell & Co., Chicago; Policy Committee, H. W. Hamilton, Koppers Co., White Tar Div., Kearny, N. J.; Public Purchases Committee, Earl Brenn, Huntington Laboratories, Huntington, Ind.; Public Relations Committee, Ira P. MacNair, MacNair-Dorland Co., New York; Chemical Analyses Committee, Disinfectant Section, A. L. Sodergreen, West Disinfecting Co., L. I. City; Disinfectant Scientific Committee, Jack C. Varley, Baird & McGuire, Inc., St. Louis; Chemical Analyses Committee, Insecticide Section, Dr. George W. Fiero, Stanco, Inc., New York; Insecticide Scientific Committee, Alfred Weed, John Powell & Co., New York; Sanitary Specialties Scientific Committee, R. B. Trusler, Davies-Young Soap Co., Dayton, Ohio; Sprayer Committee, Dr. A. Griffiths, Socony-Vacuum Oil Co., Brooklyn; Disinfectant Merchandising Committee, G. M. Baird, Baird & McGuire, Inc., Holbrook, Mass., chairman, P. L. Robbins, Geo. B. Robbins Disinfectant Co., Cambridge, Mass., vice-chairman; Insecticide Merchandising Committee, Carter Parkinson, McCormick & Co., Baltimore; Sanitary Specialties Merchandising Committee, C. L. Weirich, C. B. Dolge Co., Westport, Conn.

**"Bugrenade", the first five ounce aerosol insecticide dispenser to appear on the market is being sold domestically by Enterprise Industries, Inc., New York, at a price of 98 cents. Hand-sized and pocket-sized, it is designed with a push button, finger-tip control valve that requires only a one-hand operation. The "Bugrenade" dispenses the standard government approved DDT-pyrethrum formula and is not designed for re-filling. It will be sold to drug, chain, and department stores, as well as to airlines, steamship companies, and hotels. The export market will also be developed.**

## Norwich Names Ide

In line with a policy of expansion, Norwich Pharmacal Co., Norwich, N. Y. has appointed Knox Ide as general counsel to the company. Mr. Ide will take an active part in planning and directing the expansion and acquisition program. In announcing the appointment of Mr. Ide, who is a director of American Home Products Corp., among others, the company pointed out that scientific research will be extended and new products will be introduced in the field of packaged consumer goods. The first step in the new program was the setting up of its wholly owned subsidiary, Eaton Laboratories. In a report to stockholders, the company stated the net income of Norwich for 1946 totaled $980,725 as compared to $694,900 for 1945, an increase of 41.1 per cent.

## Wax Mfrs. Organize

Wax manufacturers in the New York area have formed a new division of the National, Paint, Varnish & Lacquer Association and will hold monthly meetings at the Hotel Pennsylvania, New York, to discuss group problems. Following a series of introductory meetings, the group was formally organized on February 25. L. D. Eldot of L. Sonneborn Sons, president of the NPVLA, was elected honorary chairman of the new division, and four vice-chairmen were selected to act as a steering committee in the planning of group activities and programs for succeeding meetings. The vice-chairmen are P. Van Kuller of O'Cedar Corp., J. E. Saal of Vestal Chemical Co., Jacob Kahn of Windsor Wax Co., and Joseph Green of Oil Specialties & Refining Co.

Mentioned as possible topics for coming meetings were the following: supply of carnauba wax, paraffin wax, cans and other scarce materials; sales policies; excessive delivery costs. In group discussion on the carnauba wax supply situation it was pointed out that No. 3 N. C. wax has dropped from its high level of $1.85 a pound several months back to a current price of $1.20 a pound. It was reported that there are still some 6,500 tons of the old crop wax unsold in Brazil, and that the new crop, which will start coming in about the end of August, will reach a record high level of 10,500 tons. It was predicted that the market would decline further over the next few months, possibly to a figure as low as $1.00 a pound.

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For an interview with an officer of the company, kindly furnish, in confidence, sufficient particulars to give our client a fairly complete picture of your situation.

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***Specialties Department***
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## New NAIDM Members

The National Association of Insecticide and Disinfectant Manufacturers, New York, recently announced the following firms have been elected to active membership: Chicago Sanitary Products Co., Chicago, C. R. Lichtenberg, pres.; Diversey Corp., Chicago, Lewis Shere, pres.; Fairfield Laboratories, Inc., Plainfield, N. J., Wellington Rounds, general manager.

## Release Octa-Klor Booklet

Information and technical data concerning the chlorinated hydrocarbon insect toxicant, "Octa-Klor," ($C_{10}H_8Cl_8$) was recently released in the form of a booklet by Julius Hyman & Co., Denver, Colo. The booklet describes the physical and chemical properties of the product, grades, insecticidal properties, action on warm-blooded animals, compatibility and suggested formulation and application procedure for controlling industrial, institutional, and household pests, as well as information regarding its use in the agricultural insecticide field. The compound, discovered by Dr. Hyman, was first discussed by Drs. Kearns, Ingle, and Metcalf in the *Journal of Economic Entomology* Dec. 1945 under the designation of "1068."

## Miner Labs Expand

Expansion of Miner Laboratories, Chicago, into the field of entomological studies was recently announced. Newly created entomological division will be equipped especially to handle research in connection with stored cereal products but will be in a position to do other types of work in the entomological field especially those not requiring greenhouse or field facilities. The new division will be headed by Barbara Miner Parker. Dr. Parker was with the entomological laboratory of the Department of Agriculture of Chico, Calif. before joining Miner Laboratories.

## Snell Moves to New York

Foster D. Snell, Inc., consulting chemists, Brooklyn, N. Y., have announced the transfer of their offices and laboratories from 305 Washington Street to 29 West Fifteenth Street, New York. The firm will occupy an entire ten-story building at the new address. The Washington Street offices had been occupied since 1933, and prior to that the company was located at 130 Clinton Street, Brooklyn.

## N. J. Mosquito Assn. Meets

The New Jersey Mosquito Extermination Association has announced that its thirty-fourth annual meeting will be held at Hotel Haddon Hall, Atlantic City, April 2, 3, and 4, 1947. The meeting will feature exhibitions on the scientific and industrial aspects of mosquito extermination.

## NIGP to Confer in New York

National Institute of Governmental Purchasing, Washington, an organization dedicated to improving governmental buying, stated on Feb. 20th that their annual conference and exhibit would be held Sept. 15-17th at the Hotel Pennsylvania, New York.

## R. N. Hill Dies

The death of Richard N. Hill was reported February 25th by the Chicago Drug and Chemical Association. Mr. Hill formerly was associated with Bristol-Myers Co., Chicago.

## DuPont Specialties Plant

E. I. DuPont de Nemours & Co., Wilmington, have announced that work will soon start on a chemical specialties plant in Toledo, Ohio, for the manufacture of automotive and household specialties, including polishes, cleaners and spot removers.

## ISCO Elects Sheffield

W. H. Sheffield, Jr. has been elected secretary of Innis, Speiden & Co., New York, it was announced late in February, following the annual organization meeting of the board of directors. Mr. Sheffield, who is assistant treasurer of the company, also was re-elected a director at the same meeting. All of the company directors were re-elected at the annual meeting which followed the yearly stockholders' meeting. W. H. Sheffield continues as president and director. E. C. Speiden was re-elected vice-president and general manager of the Isco Chemicals Division. G. S. Hamilton continues as vice-president and comptroller. C. C. Wickstead was re-elected vice-president and treasurer, and Halsey F. Sheffield was re-elected a director. T. G. Flavelle, manager of the Gums & Waxes division, continues as a director of the company.

**"Sterel", pictured at the right, is the first germicidal aerosol on the market and was recently introduced by Airosol, Inc., Neodesha, Kansas, makers of "Airosol DDT" insecticide bombs. Formula for the new product was developed by Dr. Lyle D. Goodhue, director of research for Airosol, Inc., in cooperation with the Midwest Research Institute, Kansas City. The germicides used are dipropylene glycol which kills germs in the air and "Cetab" (cetyl trimethyl ammonium bromide) which kills surface germs. "Freon" is the propellent. The product retails for $2.95.**

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Inside dimensions 7 inches by 3⅛ inches with inverted clamp lid. ⅛ inch outside flange top and bottom providing for label protection. Attractive bronze lacquer inside and out. Non-corrosive. Highly suitable for packing all type of powders and pastes. Cans packed 50 per wooden crate, wire bound with easily opened wire loop fasteners. Weight 15 lbs., crate and 50 cans. Highly desirable. 100,000 cans available at 6c each delivered. Write

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CHEMICALS is the

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*try us on Carbon Tetrachloride*

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## State Insecticide Bills

During the past month, a number of states have made progress toward adoption of new economic poisons bills developed around the uniform state insecticide act. In a recent bulletin issued by the National Association, of Insecticide & Disinfectant Manufacturers, the progress of these new bills in the legislatures of the various states was summarized. One important deviation in the Kansas House bill 70 from the proposed uniform state bill is the high cost of the proposed registration fee which is set at $25 for each product registered. Any registrant may register annually any number of brands after the payment of annual fees aggregating $250. The bill would exempt pharmacists selling chemicals in broken packages. Another objection to the Kansas bill is that the ingredient statement does not provide for alternate labeling. Also, registration under protest is not permitted.

Arkansas House bill 193 also differs in several respects from the proposed state bill. It requires no ingredient statement and provides that products registered under the Federal act need not be registered in Arkansas. The Colorado Senate bill 282 which is discussed more fully elsewhere in this issue stipulates that all ingredient statements must be based upon weight which is inconsistent with the rules of other states and with the proposed model bill. Neither does this bill provide for registration under protest. Indiana Senate bill 180 deviates by not providing an effective date and would be put in effect only by proclamation of the Governor. It also directs that the State Board of Health be the enforcement body rather than the Department of Agriculture.

Iowa House bill 160 requires full formula disclosure on the label and the registration requirement is the same as that now in effect in Minnesota law. Failure to provide for registration under protest is one of the faults claimed for the Massachusetts House Bill. The objectionable registration requirements are still present in the North Dakota Senate Bill 211, but it is expected that the bill will be amended so far as the ingredient statement is concerned to make it uniform with the state model bill. The N. A. I. D. M. reports that considerable progress is being made in getting the states to amend and modify the bills from their present form so that they will conform more nearly to the uniform proposed state bill.

## PCO's Confer at Amherst

A record registration of 170 attended the 7th Eastern Pest Control Operators' Conference at Massachusetts State College, Amherst, Mass., February 3, 4 and 5.

One of the most ambitious features on the program was the symposium on termites. Three buildings on the campus, with representative types of termite damage, had been actually treated for termite control. Last fall, inspections were made, and specifications prepared, by executives of seven eastern termite control firms. Early in December, key personnel of the same firms carried out the work. The project was headed by Robert Troup, Harder Exterminating Service, Hempstead, L. I., who led a detailed demonstration.

The rodent control program included a number of innovations. It was in charge of Walter Dykstra of the Fish & Wildlife Service, assisted by T. B. Murray, Senior Biologist, and the District personnel. Specialty demonstrations and tests were conducted by industry teams. "Deodorants" were handled by K. N. Cook, Ransford Insecticide Co., Worcester, and E. G. Maguire, Wm. A. McGuire Co., Haverhill, Mass. Bait mixing equipment and technique were demonstrated by John Medoff, Hudson Exterminating Co., West New York, N. J., and K. Thomkins, Thomkins Ext. Co., New York. Rat repellents were evaluated in a set of tests devised and conducted by Mr. Dykstra and staff. A rodent control symposium, embodying many new applications, was led by Ernest M. Mills, Fish & Wildlife Service, New Brunswick, N. J., The entire conference visited the Amherst bait mixing station of the Fish & Wildlife Service.

"Bug of the Year" for 1947 was the Dermestid group, with the laboratory exercises under the direction of Dr. C. P. Alexander and the staff of Mass. State College.

New chemicals were reviewed by manufacturers' representatives in the "Keeping Up to Date in Pest Control" session. The discussion and associated toxicity tests were under the direction of J. Edwin Sameth, Western Exterminating Co., Newark, N. J.

A report on "Rickettsialpox" was presented by Charles Pomerantz, who was responsible for the solution of this hitherto unidentified fever disease.

The Conference marked a farewell to Dr. Hugh P. Baker, retiring this year at president of M.S.C. President Baker has attended all seven of the eastern conferences. He was the principal speaker at the banquet, at which he and Mrs. Baker were presented a portable radio.

Herbert Meyer, Fernex Sanitation Co., Jamaica, L. I., officiated as toastmaster.

## Owens Glass Appoints Two

Two appointments in the sales promotion department, glass container division, Owens-Illinois Glass Co., Toledo, were announced Feb. 25th by Smith L. Rairdon, vice-president and general sales manager. Northrup F. Bowes has been made eastern sales promotion manager and Newell A. Pontet, manager of the film and display division.

## Geigy Repackage 'Gesarol'

"Gesarol E 25," product of Geigy Co., New York, is now to be marketed in a one-gallon metal container with 3-color lithographed label. The new package for this emulsifiable DDT composition will be more convenient to handle. "Gesarol E 25" contains 25 per cent DDT (by weight). It will remain stable at temperatures as low as zero Fahrenheit, the manufacturer states. It is recommended for use in the floricultural and horticultural fields.

# SOPAC

SAFETY POWDERED HAND SOAP
COMBATS DERMATITIS

• hygienically safe, fast, very economical • low alkalinity • light density • vegetable scrubber • soothing • improves working conditions • tried, tested and proved by billions of washups in all industries • "A Wee Bit Goes a Long Way" • QUALITY • VALUE • IMMEDIATE DELIVERY. ALSO • hand and machine dishwashing compounds • medium and heavy duty cleaners • no wipe auto wash • synthetics • private brands • soap dispensers.

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½ H.P. MOTOR
ADJUSTABLE NOZZLE SPRAYS IN ANY POSITION
COMPRESSOR TYPE
1 QUART CONTAINER
BROAD METAL BASE
TIME SWITCH OPERATES 1 MIN. TO 4 MINUTES AUTOMATIC SHUT OFF
VOLUME CONTROL-FINEST DIFFUSING WITH WARM AIR

**—for Spraying Liquid Insecticides —including DDT**

SPACE spraying with greater effectiveness is assured with the Model 54 MISTMASTER compressor type Time Switch Sprayer. Automatic, simple, safe. Adjustable nozzle. Sprays one ounce in 3 to 4 minutes. Thoroughly atomizes. ⅛ h.p. universal motor. 1 quart container. Weight, 4 lbs.

Residual spraying is a widespread need met with the MISTMASTER Fan-Type Sprayer. Shoots insecticides a distance of 18 to 40 feet. Three models. Motors, 1/3, 3/5 or 1 h.p. universal.

*We do not sell insecticides. Our business is the manufacture of Sprayers. (Patented in U. S. A. and foreign countries.)*

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## Innis-Speiden 25 Year Club

Members of Innis, Speiden & Co., New York chemical manufacturers, who have been with the company twenty-five years or more are shown gathered around their president, W. H. Sheffield, at the forming of a Quarter-Century Club. Seated from left to right are: Thomas G. Flavelle, manager gum and wax division and director; William H. Sheffield, president; Charles C. Wickstead, vice-president and treasurer. Other charter members, standing from left to right are: P. L. Frost, manager of sales; John Breckwoldt, accountant; George Sonnek, credit division; Rose G. Olivier, insecticide division; Herbert S. Cottrell, manager chemical department; Frank Grilli, chemical department; Herman Price, manager traffic department; Paul W. Hiller, sales department; Edward Schaaf, sales department. Other members of the club not in the picture are: Henrietta P. Runyon, Chicago branch; James O'Connell, Jr., Boston branch manager; A. F. Cuneen, Boston branch; William J. Thorn, Philadelphia branch manager; Edward D. Baumeister, sup't. Jersey City factory; R. P. Heron, Philadelphia branch.

## Purdue P.C.O. Conference

Although the detailed plans for the eleventh annual Pest Control Operators conference to be held at Purdue University, Lafayette, Ind., April 7-11, are not complete at press time, some important features have been announced: Monday—For new conference members a session will be held on fundamentals of insect structure, life and identification; Tuesday—The entire day will be given over to rat problems and demonstrations are being arranged with the following participants: Ernest Mills, Thomas Murray, G. O. Oderkirk and Milton Caroline, all of Fish and Wildlife Service; Kenneth Cook, Ransford Insecticide Co., Worcester, Mass.; Edward G. Maguire, Wm. A. Maguire Co., Haverhill, Mass., and Elmer Kuntz; Tuesday evening—educational films; Wednesday—operator demonstrations of treatments for termites and powder post beetles; Wednesday evening—operator interviews and discussion on salesmanship; Thursday a.m.-p.m.—A demonstration of different types of equipment for insecticide application, including nozzles, and methods of application; Thursday evening—Annual dinner with vice-president Hockema as toastmaster and with speakers president Hovde, Dean Freeman, and Dr. George Davis; Friday a.m.—Identification and life history of the common flies, with demonstrations on control and special reference to the use of DDT as a barn spray. Also demonstrations on the application of 2,4-D and other weed killers.

The completed program will be mailed out by the National Pest Control Association, New York, in the near future.

## Brewster DCAT Speaker

Senator Owen Brewster of Maine was the main speaker at the 21st annual Drug, Chemical and Allied Trades dinner held on March 13 at the Waldorf-Astoria Hotel, New York. Over 2,300 members of the drug, chemical, soap, insecticide and allied industries were present to hear Senator Brewster discuss American foreign policies. It was the largest gathering of chemical, drug and allied trade leaders ever to be held in the United States, according to Robert B. Magnus of Magnus, Mabee & Reynard, Inc., New York, chairman of the dinner arrangements committee.

## NSDA Meets in Chicago

Members of the National Sprayer & Duster Association met in Chicago, Feb. 13th and 14th. John F. Benham, secretary of the association, reports that the association has voted to support a program of education, research, and cooperation with other groups in obtaining consumer use of the most suitable spraying and dusting equipment.

Facilities in the industry are said to be adequate to produce supplies of sprayers needed by the trade for the coming season according to a survey made with the equipment manufacturers. Current shortages of tin plate, galvanized sheet, small motors and other essential items have retarded production somewhat in all plants.

The introduction of new insecticidal materials has been met by improvements in the design of hand and small power sprayers and dusters. New discharge equipment and better agitation in dust chambers are especially noteworthy in giving more uniform and complete coverage, Mr. Benham stated. Various new models are expected on the market as the material situation permits.

Household Cleanser — New small package private brand product put out for the trade by Twi-Laq Chemical Co. of Brooklyn. A vegetable oil jelly soap in liquid form with added pine oil, special detergents and no-rubbing wax for use on floors, woodwork, venetian blinds, etc. and porcelain surfaces such as sinks, refrigerators, etc. In quarts, half-gallons and gallons. Note space top and bottom on can label panel for private brand and company names.

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## EMULSIFIER

*primarily for highly stable DDT emulsions*

Instantaneous dispersion . . . pH slightly below 7 . . . Soluble in water, light hydrocarbons, vegetable oils, chlorinated hydrocarbon solvents . . . Maximum stability with minimum agitation.

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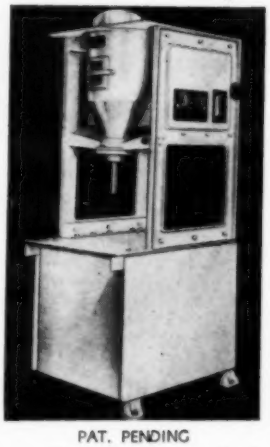

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"Quick Kill," a non-poisonous insecticide powder tested in nine cities during midsummer, will soon be introduced on a national scale. The new product for ants and roaches is made by William Peterman, Inc., insecticide manufacturers of Newark, N. J. and will be featured in counter display cartons with promotion that will emphasize single package assortment for wholesaler convenience in shipping and warehousing.

## New Boyle-Midway Plant

An addition to the manufacturing facilities of Boyle-Midway Co., Jersey City, announced recently, was the opening of a $750,000 plant at Atlanta, Ga. The new one-story building will contain warehousing facilities and sales offices. E. A. Lesher, southern divisional sales manager, will make his headquarters at the new plant. Members of the plant staff will include Lloyd Moore, factory manager; A. C. Swain, chemist; J. V. Benson, traffic manager; and J. P. Ryan, office manager.

## Natl. Can Appointments

National Can Corp., New York, recently announced the appointment of Arthur R. Jorgenson to the position of division sales manager, and the return of Irving L. Holtz to the company's sales department as district sales manager. Mr. Jorgenson has been with National Can for sixteen years and will continue his duties with headquarters at the New York Office. Mr. Holtz who has been with the company for seventeen years, will also have his headquarters at the New York Offices.

## New N.S.S.A. Services

National Sanitary Supply Association has established a new type bulletin service, "Modern Sanitation Methods," a multilith publication designed to educate and instruct members and salesmen in modern methods of sanitation and the proper means of using the products and equipment sold by the sanitary supply companies. The first issue sent out February 15 carried a full discussion of proper methods in washing walls. Facts about floors are also covered, describing types of floors and the effects of various sanitary chemicals upon them. Floor facts will be continued in forthcoming issues. The new service is edited and issued by Leo J. Kelly, executive vice-president of NSSA who states that copies will be supplied to each member in sufficient number to cover their sales force.

## Two New Insecticide Bills

The introduction of two new state economic poisons bills was reported last month. Iowa House Bill 160, introduced in the state legislature on January 30th, follows the language of the uniform state bill except in two important respects: (1) the second optional method of ingredient statement provided by the uniform state bill is not recognized. The ingredient statement requires that the name and percentage of each active ingredient together with the total percentage of the inert material be shown on the label. (2) The type of registration procedure provided in the uniform state bill is not followed. Instead, a type based upon the present Minnesota law has been followed. Under the proposed Iowa bill, the Secretary would have the right of absolute refusal of registration. State enforcement officials, however, are reported to have agreed to modifications in the proposed bill which in all major respects will bring the bill in line with the uniform state bill.

A new Colorado economics poisons bill was introduced in the state legislature recently under the title of Senate Bill 282. It differs from the uniform state bill in one major respect: in regard to the statement of type of ingredient. The language of the bill is somewhat conflicting. It is interpreted that there would be required on the label an ingredient statement showing the name and percentage of each active ingredient regardless of the toxicity of the product. Under the uniform state bill, only the name and percentages of the active ingredients as determined by the Secretary or Commissioner as being toxic to man are necessary on the label. There has been no report of the progress of the Colorado bill as we go to press.

## So. Dakota Poisons Bill

A new economic poisons bill was introduced in the South Dakota Senate early in February under the title of Senate Bill No. 93. This bill follows the pattern of the uniform state bill in all major respects with the following exceptions: 1. Licensed pharmacists would be permitted to make broken package sales. 2. The Secretary of Agriculture would be authorized to refuse registration. 3. The bill specifies the minimum height of the skull and crossbones and the word "poison" on the labeling of toxic products. The minimum size specified is one-fourth inch, and 4. Private brand products bearing the same formula can not be registered as one product. The new bill sets registration fees at $5 for each of the first five economic poisons and $1 for each product in excess of this number. Registrations would expire on June 30th of each year.

## Herbert Johnson Elected

Herbert F. Johnson, president of S. C. Johnson & Sons, Racine, Wis., was recently elected a director of the Wisconsin State Chamber of Commerce. Mr. Johnson has long been prominently identified with the United States Chamber of Commerce.

## NEW F.O. MOTHICIDE

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**SAVE SCARCE PARA OR NAPHTHALENE AND DOUBLE YOUR MOTHICIDE SALES!**

A synergist (an ACTIVATOR) for either Paradichlorobenzene or Naphthalene. Carefully controlled entomological tests prove formulations using 50% POLYCHLOR 1940 and 50% Para render a mothicide equal to pure Para; 20% Naphthalene added to POLYCHLOR 1940 (without Para) produces a superior mothicide.

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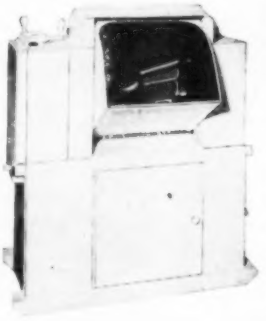

These machines were manufactured for the Government, by the Read Machinery Company and the Century Machinery Company.

They are sturdily constructed and are ideal for mixing small batches up to 75 pounds.

They can be furnished equipped with Briggs & Stratton gasoline engine or with a 1 H.P. electric motor.

These machines are portable and require a floor space of 20" x 38".

Price — complete with gasoline engine, $395.00, f.o.b. New York, crated; with electric motor, $495.00 f.o.b. New York crated.

Telephone or telegraph your order in at once.

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268 West Broadway New York 13, N. Y.
*Established* 1882

## INSECT REPELLENTS

(*From Page* 127)

Dr. Calvery (11) had reported recommendation in a restricted sense including regulatory measures for 201, that 448 with practically no skin toxicity as compared to 201, and being one-half as toxic as 201, when fed to animals, could be used for general application in the tropics. It is of interest to note the variation in repellent effectiveness based on environmental conditions. We have been told repeatedly that oil of citronella, having poor spatial insectifugal action in the tropics has considerable spatial effectiveness in the Arctic (Alaska) against the similar species of mosquitoes in colder climate. 448 and other repellents, while having longer protective periods than oil of citronella, do allow insects to come in close contact with skin before they are repelled. The converse is true in hot environments.

So far the ideal repellent for all environmental conditions and all insects is not known. There appears to be satisfactory evidence that the series of diols synthesized by Wilkes, and the hydrogenated naphthol and diphenyl derivatives synthesized by ourselves offer clues for further investigation. Furthermore, the latter are combined contact and respiratory insecticides with low residual action. This combined insecticidal and insectifugal activity may or may not prove of value, and this problem is now receiving the attention of entomologists.

In closing it must be emphasized that the work originated during the war should not be abandoned and that all encouragement be given to the Department of Agriculture towards continuing the experimental work at Orlando. The work so far represents coordinated effort and this coordination should be maintained especially where the problem involves the harmonious inquiry on the part of both chemist and biologist into this complex problem of insect physiology.

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**TABLE 5.—Mixtures of compounds which repel aedes aegypti for longer than 240 minutes (4 hours) at environmental temperatures of 90° F. dry bulb, 80° F. wet bulb.**

| *Number* | *Repellent Chemicals* | *Percent (vol.) of each* | *Number of Tests* | *Average time to first bite (minutes)* |
|---|---|---|---|---|
| 407 | 2-phenyl cyclohexanol (washed) | 70 | — | — |
| | 2-naphthol 1,2,3,4-tetrahydro, acetyl-glycine ester and dihydro naphthalenes | 30 | 3 | 322 |
| 406 | 2-phenyl cyclohexanol (washed) | 70 | — | — |
| | 2-naphthol, 1,2,3,4-tetrahydro, glycollic ether (crude) | 30 | 3 | 293 |
| 448 | 2-phenyl cyclohexanol (washed) | 70 | — | — |
| | 2-cyclohexyl cyclohexanol (washed) | 30 | 6 | 289 |
| 403 | 2-phenyl cyclohexanol (washed) | 70 | — | — |
| | di(2-naphthol, 1,2,3,4-tetrahydro) ester of oxalic acid | 30 | 3 | 280 |
| 465 | 2-phenyl cyclohexanol (washed) | 70 | — | — |
| | 2-naphthol, 1,2,3,4-tetrahydro 1-methyl | 30 | 3 | 279 |
| 464 | 2-phenyl cyclohexanol (washed) | 70 | — | — |
| | 2-naphthol, 1,2,3,4-tetrahydro 1-methyl, acetate | 30 | 3 | 274 |
| 424 | 2-phenyl cyclohexanol (washed) | 70 | — | — |
| | 2-naphthol, 1,2,3,4-tetrahydro acetyl glycine ester (120°-139°C., 15mm.) and dihydro naphthalenes | 30 | 4 | 272 |
| 466 | 2-phenyl cyclohexanol (washed) | 70 | — | — |
| | 2-naphthol, 1,2,3,4-tetrahydro 1-ethyl | 30 | 3 | 272 |
| 455 | 2-phenyl cyclohexanol (washed) | 70 | — | — |
| | 0-3916 Orlando (USDA) | 30 | 4 | 257 |
| 201 | 2-naphthol, 1,2,3,4-tetrahydro (washed) | 30 | 16 | 255 |
| | 2-phenyl cyclohexanol (washed) | 70 | — | — |
| 422 | 2-phenyl cyclohexanol (washed) | 50 | — | — |
| | 2-naphthol, decahydro, trans. | 25 | 4 | 246 |
| | Ethyl alcohol | 25 | 4 | 246 |

**TABLE 6.—Comparison of the repellent activity of 448 and 201.**

| *Species repelled* | *Average period of complete protection (in hours) afforded by* | |
|---|---|---|
| | *NRMI-448* | *NMRI-201* |
| Insects: | | |
| Aedes aegypti | 5 | 3.5 |
| A. taeniorhynchus | 5-6 | 3.5-4 |
| A. euplocamus | — | 3.5 |
| A. augustivitatus | 10+ | — |
| Anopheles albimanus | 11+ | 11+ |
| A. darlingi | 9+ | — |
| A. pseudopunctipennis | 10+ | 11+ |
| Psorophora ferox | 10+ | — |
| Uranotaenia spp | 10+ | — |
| "Bedbugs" | 12+ | 12+ |
| "Sandflies" | 4+ | 3-7 |
| Mites: "Chiggers" | 8+ | 8+ |

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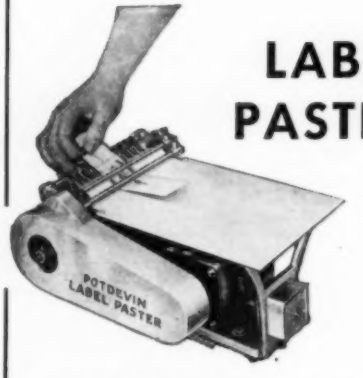


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## SURFACE-ACTIVE CATIONS

(*Turn to Page* 93)

rayon manufacturing. The presence of very minute quantities prevents "cratering" of the platinum spinnarets.

Wool which has been treated with surface active cations will adsorb negatively charged colloidal particles, such as rubber from rubber latex. Blow (35) has shown that fabrics prepared in this way possess desirable properties, and that the same result may be obtained by reversing the charge on the rubber particles. This is readily accomplished by adding the latex with stirring to an excess of a solution of surface active cation (36). Similar treatments have been suggested for causing mineral oil to exhaust onto woolen blankets, to prevent dusting with possible spread of disease through dust-borne bacteria.

The same principle is utilized in dyeing nylon with direct cotton dyes (37), in "dyeing" glass with pigments, and in applying various types of finishing materials to textiles. Mixtures with lecithin and with mineral oil are employed in the tanning of fine leathers (38,39).

Gilman and Bakh (40) as well as Powney and Wood (41,42,43) have measured the electrophoretic mobility of air bubbles, "Nujol," and various finely divided solids in solutions of surface active cations. Generally very small quantities of surface active cation are required to impart a positive charge to droplets or particules; eventually a concentration is reached beyond which there is little change in mobility.

### *Summary*

SURFACE active cations concentrate and orient at interfaces; they denature proteins and may precipitate them above their isoelectric points; they produce splitting of symplexes and precipitate chromo-proteids; they inactivate catalase, and presumably other enzymes; they produce lysis in red blood cells and in bacterial cells; they impart positive charges to suspended particles; they are strongly absorbed by cellulose, glass, and many minerals. It is to be hoped that a wider knowledge of their properties will clarify certain questions relating to the mechanism of their antibacterial action, and will assist in the development of improved procedures for determination of their germicidal efficiency.

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## Pyrin-20 Booklet

A 40-page, three color, plastic-bound catalog entitled, "Improved Pyrin No. 20," was issued in mid-February by John Powell & Co., New York, manufacturers of basic insecticides, and is available upon request from the company. Illustrated with photographic reproductions, charts, graphs and tables, the new catalog describes the "Powco" brand product which is a pyrethrum base insecticide concentrate designed for use in the manufacture of household sprays, stock sprays and industrial-type insecticides. Tables show comparisons of "Improved Pyrin No. 20" in performance against "Pyrethrum Extract No. 20," knockdown of house-flies with the new product compared with the official test insecticide, kill of house-flies expressed as OTI difference, effect of "Improved Pyrin No. 20" on German roaches, etc. Included for the first time is a description and structural formula of "Sesamine," the synergist in "Improved Pyrin No. 20" which increases the killing power of the pyrethrins 200 to 300 per cent.

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THE answers to "Twenty Questions on Synthetic Detergents," are given in a booklet issued by the P & G Division of Consumer Service. One of the best pieces of sales promotion literature we have seen in many a moon!

* * *

Lever Brothers will start test marketing this month in several areas of their new synthetic detergent, "Breeze."

* * *

Every week, a new low-pressure aerosol insecticide report, rumor, or what-have-you pops into the quiet charm of our editorial office. Although we had been told that the cheap "beer-can" aerosol was a 1948 consumer item, —and no sooner than that,—this week's rumor says one of the can companies is ready to shoot,—and soon.

* * *

Did you read about that 700 tons of American caustic soda which was shipped to Bulgaria on a swap for tobacco? Apparently a number of American caustic buyers did, especially a few soapers. Their comments reproduced here, gentle reader, would not, we fear, fit into the picture of pristine purity usually presented by these pages,—but your imagination can probably give you a reasonable facsimile of what we cannot publish.

* * *

Several of our editorial staff saw recently in New York a preview of the new insect control movie made for Rohm & Haas. It is, without question, the best movie of its type we have ever been privileged to see, and should do a lot to boost insecticide sales. The industry owes R & H a vote of thanks for an excellent public relations job.

* * *

Returning from a two month trip through South America recently, John Powell, NAIDM treasurer and pres. of John Powell & Co., New York, gave it as his personal and confidential opinion upon alighting from a plane at New York that people should use more insecticides.